# Airport privatisation and performance

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# AIRPORT PRIVATISATION AND PERFORMANCE

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But first and foremost, my heartfelt esteem to my beloved Charming Lady, Roswitha, for still being the wind beneath my wings – after all these years. Sorry Rose, I just cannot top it!

## ABSTRACT

This study assesses the financial performance of a representative sample of 35 European commercial airports for the period 1990 to 1999 inclusive, comparing those subject to partial or full privatisation with those in public ownership. It is hypothesized that privatised airports operate more efficiently than others and that they are an attractive investment as compared to alternative capital projects. Partial factor productivity (PFP), total factor productivity (TFP) indicators and financial ratio analysis (FRA) outcomes are compared, in order to investigate differences which may be attributable to the degree of privatisation.

The main results of PFP and FRA indicators are tested by an independent and a paired-samples t-test for differences between airports in public, mixed public-private and fully private ownership. Changes in performance after a change in ownership structure are reviewed. The analysis of sample data reveals economically meaningful and statistically significant differences between publicly owned and privatised airports. The latter group is not a homogeneous one but shows decisive structural differences between partially and fully privatised companies.

The major differences lie in operating efficiency, asset utilization and capital structure, which vary substantially with the respective ownership status. Whereas privatised airports are more cost efficient, publicly owned airports generate comparatively higher ratios of unit revenues and work load units to total assets. Their asset turnover is higher but the capital expenditure to total revenue ratio is lower.

The increased operating efficiency of partially and fully privatised airports does not, however, translate into higher returns on equity in general. Only partially privatised

sample airports may be considered an attractive investment. Regarding capital structure and financing of productive assets, publicly owned airports assume more debt relatively to their respective shareholders' funds, which results in considerably higher gearing and financial leverage, compensating for the comparatively low return rate on assets.

Based on the findings of this research, key success factors and value drivers of the airports' business model are identified and consequences for airport management are deduced. Major contributions to the knowledge on the subject result from an application of financial ratio analysis to the sector, including the analysis of capital structures, the usage of performance indicators and financial ratios before and after privatisation and from conducting a DEA analysis strictly based on financial variables.

# LIST OF ABBREVIATIONS

| | |
|---|---|
| A | Actual |
| ABB | Asea-Brown-Boveri |
| ABZ | Aberdeen, UK |
| ACI | Airports Council International |
| AdM | Aéroports de Montréal (AdM), Canada |
| ADP | Aeroports de Paris Group, France |
| ADR | Aeroporti di Roma, Italy |
| ADV | German Airports Association |
| AEA | Association of European Airlines |
| AENA | Aeropuertos Espanoles y Navegacion Aerea |
| AGI | Airports Group International |
| AIP | Airport Improvement Program |
| AMS | Schiphol Group, Netherlands (Amsterdam) |
| ANA | Aeroportos de Portugal SA (Aeroportos e Navegacao) |
| AREWLU95 | Aeronautical Revenue per WLU (indexed to 1995) |
| ATM | Air Transport Movements |
| ATRG | Air Transport Research Group |
| ATRS | Air Transport Research Society |
| BAA | BAA plc Group, UK |
| BAAA | Belgian Airport and Airways Agency, Belgium |
| BATC | Brussels Airport Terminal Company, Belgium |
| BBF | Berlin Brandenburg Flughafen Holding |
| BBI | Berlin Brandenburg International |
| BCC | Banker-Charnes-Cooper |
| BCIA | Beijing Capital International Airport |
| BEF | Belgian Franc (currency) |
| BEFAFTER | Before / After Partial or Full Privatisation |
| BEP | Basic Earning Power |
| BER | Berlin Group, Germany |
| BFS | Belfast, UK |
| BHX | Birmingham, UK |
| BIAC | Brussels International Airport Company, Belgium |
| bn | billion |
| BOT | Build, Operate, Transfer |
| BRS | Bristol, UK |
| BRU | Brussels, Belgium |
| B/S | Balance Sheet |
| BSL | Basel Mulhouse, Switzerland |
| $b_0$ | Constant / Intercept |
| $b_1$ | Slope / Regression Coefficient |
| c / CRS | Constant Returns to Scale |
| CAA | Civil Aviation Authority |
| CAGR | Compound Annual Growth Rate |
| CAS | Centre for Airport Studies, Sydney |
| capex | Capital Expenditure |

## LIST OF ABBREVIATIONS (cont'd)

| | |
|---|---|
| CAPEXDEP | Capital Expenditure to Depreciation Ratio |
| CAPPAX95 | Capital Expenditure per Terminal Passenger (indexed to 1995) |
| CAPTREV | Capital Expenditure in Percent of Total Revenue |
| CARGOWLU | Cargo WLUs |
| CC | Competition Commission<br>(formerly MMC - Monopolies and Mergers Commission) |
| CCR | Charnes-Cooper-Rhodes |
| CDG | Roissy-Charles-de-Gaulle, France |
| CEPS | Cash Earnings per Share |
| CFCAPEX | Investment Coverage Ratio (Cash Flow / Capital Expenditure) |
| CFTREV | Cash Flow in Percent of Total Revenue |
| CGN | Cologne, Germany |
| CHF | Swiss Franc (currency) |
| CIA | Ciampino, Italy |
| CIPFA | Chartered Institute of Public Finance and Accountancy |
| CPH | Copenhagen, Denmark |
| CREPAX95 | Commercial Revenue per Terminal Passenger (indexed to 1995) |
| CRI | Centre for the Study of Regulated Industries |
| CWL | Cardiff, UK |
| d / DRS | Decreasing Returns to Scale |
| d.f. | Degrees of Freedom |
| DCF | Discounted Cash Flow |
| DEA | Data Envelopment Analysis |
| DEARTS | DEA Returns to Scale |
| DEASCORE | DEA Scores |
| DEBTRATI | Debt Ratio |
| DEM | German Mark (currency) |
| DEPWLU95 | Depreciation costs per WLU (indexed to 1995) |
| DGAC | Direction Generale de l'Aviation Civile |
| DKK | Danish Krona (currency) |
| DMU | Decision Making Unit |
| DPS | Dividend per Share |
| DrKW | Dresdner Kleinwort Wasserstein |
| DUB | Dublin, Ireland |
| DUS | Dusseldorf, Germany |
| E | Estimates |
| EBIT | Earnings before Interest and Taxes or Operating Profit |
| EBITA | Earnings before Interest, Taxes and Amortization |
| EBITDA | Earnings before Interest, Taxes, Depreciation and Amortization |
| EBITDAMA | EBITDA Margin |
| EBT | Earnings before Taxes |
| EC | European Community |
| ECU | European Currency Unit |
| EDI | Edinburgh, UK |
| EIN | Eindhoven, Netherlands |

| | |
|---|---|
| EMA | East Midlands, UK |
| EPS | Earnings per Share |
| ~E0 | Datastream Synthetic Euro |
| EU | European Union |
| EUR / € | Euro (currency) |
| EV | Enterprise Value |
| F | F-Statistic |
| FASSTURN | Fixed Asset Turnover |
| FCF | Free Cash Flow |
| FCO | Fiumicino, Italy |
| FDH | Free Disposal Hull |
| FINLEVER | Financial Leverage |
| FRA | Financial Ratio Analysis |
| FRA | Frankfurt, Germany |
| FRF | French Franc (currency) |
| FTSE | Financial Times Stock Exchange |
| FY | Fiscal Year |
| GBP | Great Britain Pound (currency) |
| GDP | Gross Domestic Product |
| GEARING | Gearing (Debt / Equity Ratio) |
| GLA | Glasgow, UK |
| GTFP | Gross Total Factor Productivity |
| GVA | Geneva, Switzerland |
| HAJ | Hanover, Germany |
| HAM | Hamburg, Germany |
| i / IRS | Increasing Returns to Scale |
| IATA | International Air Transport Association |
| ICAO | International Civil Aviation Organization |
| IEP | Irish Punt (currency) |
| IMF | International Monetary Fund |
| INTLPAX | International Passengers |
| IPO | Initial Public Offering |
| IT | Information Technology |
| LBA | Leeds Bradford, UK |
| LGW | London Gatwick, UK |
| LHR | London Heathrow, UK |
| LIN | Linear |
| LLAL | London Luton Airport Ltd. |
| LLAO | London Luton Airport Operations |
| LPL | Liverpool, UK |
| LTN | Luton, UK |
| m | Meter |
| (m) | Million |
| MAG | Manchester Airport Group |
| MAN | Manchester, UK |

| | |
|---|---|
| mio / (m) | Million |
| Mkt cap | Market Capitalization |
| MMC | Monopolies and Mergers Commission |
| mppa | Million Passengers per Annum |
| MPSS | Most Productive Scale Size |
| MRS | Marseille, France |
| Mth | Method |
| NAP | Naples, Italy |
| NASHTREV | Non-Aeronautical Share of Total Revenue |
| NASSTASS | Net Assets in Percent of Total Assets |
| NCL | Newcastle, UK |
| NERA | National Economic Research Associates |
| NETPTASS | Return on Total Assets (ROA) |
| O&D | Origin and Destination |
| OCOWLU95 | Operating Cost per WLU (indexed to 1995) |
| OECD | Organisation for Economic Co-Operation and Development |
| OPMARGIN | Operating Margin |
| ORK | Cork, Ireland |
| ORY | Orly, France |
| OWNER1 | Ownership Structure 1 (Publicly Owned vs. Privatised Airports) |
| OWNER2 | Ownership Structure 2 (Publicly Owned vs. Partially Privatised vs. Fully Privatised |
| OWNERSHIP | Ownership Structure |
| (p) | Pence |
| P&L | Profit and Loss Account |
| P/E | Price Earnings |
| PAX | Passengers |
| PFC | Passenger Facility Charges |
| PFP | Partial Factor Productivity |
| PPP | Public Private Partnership |
| PPS | Production Possibility Set |
| PSA | Prices Surveillance Authority |
| r | Pearson's correlation coefficient |
| $R^2$ / Rsq | Pearson's coefficient of determination |
| REGION1 | Geographical Location 1 (British Isles vs. Mainland Europe) |
| REGION2 | Geographical Location 2 (UK/Irish vs. BAA Owned vs. other European vs. German) |
| RevEx | Revenue / Expenditure Ratio |
| RIA | AerRianta Group, Ireland |
| ROA | Return on Assets |
| ROCE | Return on Capital Employed |
| ROE | Return on Equity / Shareholders' Funds |
| RONA b.I.a.T. | Return on Net Assets before Interest and Taxes |
| ROS | Return on Sales / Total Revenue |
| RPI | Retail Price Index |

| | |
|---|---|
| RPK | Revenue Passenger-Kilometre |
| RTM | Rotterdam, Netherlands |
| RTS | Returns to Scale |
| S&P | Standard & Poor's |
| SARS | Severe Acute Respiratory Syndrome |
| SBC | Swiss Bank Corporation |
| SD | Standard Deviation |
| SEA | Società Esercizi Aeroportuali SpA |
| SFA | Stochastic Frontier Analysis |
| Sig. | Significance |
| SNN | Shannon, Ireland |
| SOU | Southampton |
| SPA | Share Price Analysis |
| SPSS | Statistical Package for the Social Sciences |
| STM | Symonds Travers Morgan Ltd. |
| STN | Stansted, UK |
| SXF | Berlin-Schoenefeld, Germany |
| t | t-Value |
| TAM | Total Aircraft Movements |
| TBI | TBI plc (Thomas Bailey International) |
| TCOWLU95 | Total Cost per WLU (indexed to 1995) |
| TFP | Total Factor Productivity |
| THF | Berlin-Tempelhof, Germany |
| TMPI | Translog Multilateral Index |
| tn | Tonnes |
| TOTALWLU | Total WLUs |
| TREVSHF | Total Revenue per Currency Unit of Shareholders' Funds |
| TREVTASS | Total Asset Turnover |
| TREWLU95 | Total Revenue per WLU (indexed to 1995) |
| TRL | Transport Research Laboratory |
| TXL | Berlin-Tegel, Germany |
| UBS | Union/United Bank(s) of Switzerland |
| UCCEGA | Union of Chambers of Commerce and Airport Management |
| USD | United States Dollar (currency) |
| VAT | Value Added Tax |
| VFP | Variable Factor Productivity |
| VIE | Vienna, Austria |
| VRS | Variable Returns to Scale |
| WACC | Weighted Average Cost of Capital |
| WLU | Work Load Unit |
| WLUTASS | Asset Utilization (WLU / Total Assets in '000) |
| (x) | Times |
| YVRAS | Vancouver Airport Services |
| ZRH | Zurich, Switzerland |

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# PREFACE: PERSONAL RESEARCH CONTEXT

The author has extensive experience in various managerial roles in financial controlling and management with one of the leading airport operators at headquarters and abroad. Nevertheless, this study has been exclusively conducted in his personal capacity and views mentioned herein should not be attributed to his current position as Head of Reporting & Standards within the division of Global Investments & Management at Fraport AG, Frankfurt Airport Services Worldwide.

This study has been prepared on the basis of information publicly available. Own research on partial factor productivity is building on previous work undertaken at both the University of Westminster and Cranfield University, UK, while financial ratio and share price analyses are to a certain extent based on the candidate's Masters dissertation carried out at Embry-Riddle Aeronautical University, Florida, USA. The application of financial ratio analysis and of data envelopment analysis to financial airport data are as genuinely unique as the application of several statistical procedures in the course of the extended data analysis on publicly owned versus partially and fully privatised airports. The respective results are an independent and original contribution to the body of knowledge.

The author hereby declares that the work of the study submitted is his own. The University of Westminster / Cranfield University Airport Economics and Finance Symposium in March 2002 and the Universities' Transport Study Group Conference in January 2004 provided an opportunity to present interim findings of this research.

# CHAPTER 1

# INTRODUCTION - THE PROBLEM AND ITS SETTING

Between the events of September 11, 2001, and the centennial of powered flight on 17 December 2003, the entire aviation industry has endured an unprecedented number of external shocks. The pace of global economic recovery, passenger confidence and developments in the airline sector will be key to renewed sustainable growth in the air transport industry. For the airport sector, this will in turn provide new business opportunities as well as a number of challenges. The asset-intensive nature of the airport business requires the constant ability to attract additional capital. From the investor's point of view, airports are a safer play on the growth perspectives of civil aviation than airlines, but they are neither immune to external tremor nor a they a homogeneous group (Standard & Poor's, S&P, 2003; Dresdner Kleinwort Wasserstein, DrKW, 2004).

## 1.1 Aims of this Research

The primary aim of this study is to provide a precise assessment of the financial performance of European commercial airports in public and in private ownership. It will be hypothesized that privatised European commercial airports operate more efficiently than others and that they are an attractive investment as compared to alternative capital projects.

The financial performance of 35 European commercial airports will be assessed for the period 1990 to 1999 inclusive, comparing those subject to partial or full privatisation with those in public ownership. Partial factor productivity, total factor productivity indicators and financial ratio analysis outcomes will be compared and tested statistically, in order to investigate differences which may be attributable to the degree of privatisation. Furthermore, changes in performance after a change in ownership will be reviewed.

A secondary aim of this study is to identify key success factors and value drivers of the airports' business model and to deduce consequences for airport management.

## 1.2 Recent Events and Trends in the Airport Sector

From an operational point of view,

> "the airport forms an essential part of the air transport system, because it is the physical site at which a modal transfer is made from the air mode to land modes. Therefore, it is the point of interaction of the three major components of the air transport system: The airport, ..., the airline. the user" (Ashford, Stanton & Moore 1997, p.1).

Or, more practically speaking, airports are one or more runways and complementary facilities for aircraft, such as taxiways, apron area, aircraft stands etc. and associated terminals and facilities for passenger and freight handling (Doganis 1992; Kazda & Caves 2000; National Economic Research Associates, NERA, 1998).

Within this airport system, the typical role of an airport operator is to provide and maintain all necessary infrastructure as well as essential services. These core activities regularly include passenger search and perimeter security, fire fighting and cleaning and maintenance of passenger areas. The operator also allocates space and resources, both between airlines (i.e. check-in counters, departure lounges) and concessionaires. Additional services are usually provided by airlines or handling agents (passenger check-in, baggage handling, aircraft maintenance) and control authorities (customs, immigration, air traffic control). Airport charges are governed by national rules and usually set after consultation with airport users and/or their representative bodies, as recommended by the International Civil Aviation Organization (ICAO) (Doganis 1992; Kazda & Caves 2000; NERA 1998; Sharpe, Birtles, & Duke 2001).

Airports play an important role in the air transport industry in general, as well as in the economic and social development of the regions they serve. Nowadays, they are operating in an increasingly competitive market and become more commercially oriented enterprises with an ever-increasing share of average revenue of non-aeronautical origin. An unprecedented enthusiasm for commercialisation is taking hold of the airport sector as it is gearing up to grow, to secure investments in infrastructure and to provide a reasonable

return on assets to the shareholders. Privatisation, global groupings and even low-cost competition are ranking high on the industry's agenda. The old public service concepts are increasingly being replaced by cost containment, private finance, aggressive marketing and also acquisition strategies. And just like the no-frills carriers are challenging the network majors, regional and city airports are rocking the market (Bates 2001; Endres & Yates 1998; Gill & O'Toole 1998; LeTourneur 2001; Swiss Bank Corporation, SBC, 1997a).

At the same time as public spending and airport user charges are subject to closer scrutiny, costs must be reduced and new revenue sources found. New concepts of ownership, financing, management and operations are emerging. Traditional patterns of state involvement are increasingly being questioned and EU rules assert that governments shall not subsidise airports. Moreover, airlines are fighting increases in fees, which ICAO and the International Air Transport Association (IATA) state average between four and five percent of the aviators' unit cost. Latest data of Airports Council International (ACI) suggests that aeronautical charges proved to be rather constant and moved in a narrow range, accounting for about 4%. Yet, charges make up for roughly 60% of world airport revenues and around 50% of the major European hubs which are listed at a stock exchange: BAA plc, Copenhagen Airports, Fraport, Vienna Airport and Unique Zurich Airport (ACI Europe 1997a, 2002, 2003a; Butterworth-Hayes 2000; Feldman, J.M., 1997, May; Greenwood 1996; Pilling 2003, 2004; Symonds Travers Morgan Ltd., STM, 1996).

The abolishment of intra-EU duty-free initially also reduced sales to non-EU passengers due to the lack of a uniform successor regime, adding to passenger confusion after a long lasting high profile campaign to keep it. In the meantime, airport revenue had basically levelled off in the previous range. But the sharp decline in passenger numbers following the events of September 11 and the sluggish recovery are still making commercial activities a complex case in general. Additional costs of new security measures

and for insurance premiums are another concern of airports, which are asset-heavy enterprises with high fixed costs (Ashman 2000; Citrinot 2002; Rozario 2001).

The airlines, on the other hand, which are subject to distinctive cyclical developments anyhow, try hard to control costs in order to improve their operating margins in an ever-increasing competitive, post-deregulation, post-September 11 environment. IATA's estimates of cumulated total losses amount to somewhere around 30 billion USD for the years 2001-2003 on a global basis. Airlines are arguing that profits from commercial activities should be offset from aeronautical costs in terms of a 'single-till', cross-subsidising aviation operations and finally reducing aeronautical fees. This approach for the calculation of airport charges is highly controversial and not necessarily always consistent with sound economic principles. It is at least arguable that in a private marketplace these services would be priced individually, each covering for its own costs. In the worst case, rebating those funds to airlines reduces the airports' ability to finance capital investment, enhance passenger service levels – including commercial facilities – and even increase traffic demand at the most congested places via lower fees (Association of European Airlines, AEA, 2003; Airline Business 2003; Abeyratne 2001; ACI Europe 1997a, 2002; Air Transport World 2004; Behnke 2000; Butterworth-Hayes 2000; Donoghue 2004; Field & Pilling 2003; IATA 2003; ICAO 1991; Pilling 2003).

Although airports have to succeed within the context of the respective financial, political and cultural communities, they might also start collaborations and even try to build networks in order to look for synergies, co-ordinate purchasing, marketing or airline services which may ultimately deliver economies of scale. By the end of 1999 for example, Schiphol and Frankfurt entered into a strategic alliance, also with the intention to join forces in international projects. Whether such co-operations will survive is depending on the effective value added, while airlines are already alerted of a potential airport monopolisation on a global scale (Gethin 2001).

As one result of the above-stated it may be expected that the world's airport business could be dominated by up to a dozen operating companies, mirroring the accelerating consolidation in the airline sector. At the turn of the century, around half of the world's passenger traffic was already channelled through the top 50 airports, the number of owners being even less than that. Several airport operators are aiming to become global players, first and foremost UK's long privatised BAA. It already operates or manages airports in Australia, Italy and the USA. Thomas Bailey International (TBI) is now present at forty airports world-wide after its acquisition of Airports Group International (AGI). As Italy's hubs prepare for (full) privatisation, they are also demonstrating global ambitions: While Rome acquired a 20% stake in the South African airport system, Milan took over 33 of Argentina's airports. In addition, Aeropuertos Espanoles y Navegacion Aerea (AENA), Aeroports de Paris (ADP), Frankfurt's Fraport (FRA) and Amsterdam's Schiphol Group (AMS) may eventually emerge as European-based global groups. On the other hand, international expansion strategies have produced mixed results so far, due to high acquisition prices and the lack of a consistent approach (Deutsche Bank 2000; Doganis 1997, 1999; Gill & O'Toole 1998; Humphreys 2003; Skapinker 1998).

### 1.3 European Aviation Liberalisation and its Impact on the Airport Industry

Liberalisation, deregulation and privatisation have been in the limelight of economic discussion for more than a quarter of a century. The aviation industry has been sharply impacted, including airports. In Europe, the final stage of air transport liberalisation came into force on 1 April 1997. But the new freedom could be meaningless until slot allocation and air traffic control problems are resolved. Recent legislative initiatives of the European Commission includes a proposal for additional or not used slots and two options for dismantling the 'grandfather rights' system. In any case,

accommodating the projected traffic growth demands substantial additional investment, which in turn requires considerable private sector capital (ACI Europe 2001a, 2003b; Baker 2001; Borenstein 1997; Button, Haynes & Stough 1998; Cranfield University 1996; George 2000; Learmount 2000, 2003; Moxon 1997, 2003).

With the liberalisation of the industry and advent of the low-cost carriers competition between airlines is likely to increase even further. It will result in additional growth because of increased frequencies of services and new point-to-point routes at lower fares between regional airports. In parallel with deregulation we have witnessed continued consolidation within the airline industry, predominantly in operational terms. The use of scheduling (code-sharing), marketing and information technology (IT) alliances rather than mergers and acquisitions has a material effect on airports, especially with regard to transfer traffic volumes. The most significant trend, however, is the fact that competition is more and more taking place between business systems, comprising a flag carrier and its alliance partners, including the respective major and secondary hub (Airline Business 2003; Commerzbank 2001a; Dennis 1999; Doganis 1999; Feldman, J. M., 2002; Lawton 2002; Nelms 1999; O'Toole 2002; Pinkham 2002).

While the economic slowdown of 2000 already started to severely threaten the profitability of airlines, airports were less affected by the cyclical nature of the industry and the beginning of this latest downturn may have even been perceived as a temporary respite from ever-worsening congestion. Airlines tended to have much more debt financed capital structures than their infrastructure suppliers, resulting in higher financial leverage and exposure to a traffic and revenue decline. The sequence of events starting with the terrorist attacks on September 11, 2001, however, had a fundamental impact on the entire aviation industry (Air Transport World 2001; Aviation Strategy 2003; Commerzbank 2001b; Doganis 2001; Field 2001; Ionides, Rayko & Wastnage 2001; Jasper 2001).

Meanwhile, traffic dynamics have changed and overall demand has recovered more rapidly following SARS (severe acute respiratory syndrome) and the war on Iraq than after the Gulf War in 1991 or September 11. According to current forecasts by industry organizations and airframe manufacturers, the air transport industry can still expect healthy overall average growth rates in the vicinity of 5% percent per year for the long-term future. IATA and ICAO are predicting a steady recovery in 2004. For international traffic, a bouncing-back effect between six to eight percent is being projected for the near term. Historic evidence also shows that air transport grows where economies grow, although there is considerable regional and cyclical variation. In the long run, economic growth generates a disproportionately large increase in travel growth. The overall pattern of revenue passenger-kilometre (RPK) growth is about two percentage points above gross domestic product (GDP). This is primarily induced by a decline of airfares, increasing international trade and additional services, and is experienced independently from the overall economic development (Airbus 2002, 2003; Boeing 2001, 2002, 2003; Campbell 2003; Donoghue 2004; Pilling & Baker 2004; Standard & Poor's 2003).

The general prospects are also likely to provide a wealth of new business opportunities as well as numerous challenges. Long-term 5% growth on average implies a doubling of traffic about every fifteen years. The resulting need for capital expenditure turns out to be the most important of these with regard to international airports. Congestion is looming ahead at most of the European and busiest US key hubs. The industry is embarking on a world-wide upgrade of facilities and investment in fixed assets to absorb the traffic growth and to accommodate for the size and processing requirements of the Airbus A380. Major capacity enhancement programmes are already or will be taking place shortly to a yet unknown extent in every region of the world. Future estimates vary somewhere around 500 billion USD for the period up to 2020 (ACI Europe 2001b; Airports International 2004; Aviation Strategy 1998; Gangl 1999; Gill 1998; Gill &

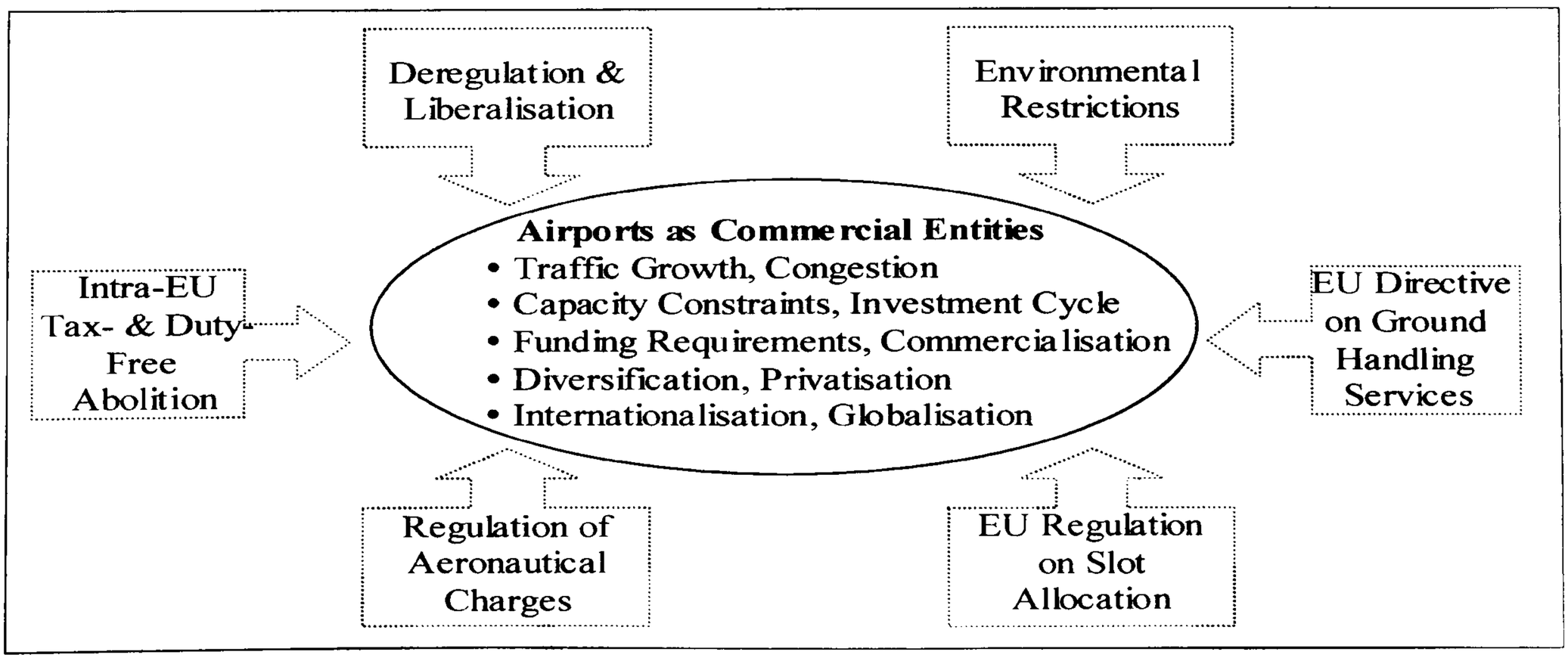
O'Toole 1998; Humphreys 2003; Jane's Airport Review 1999; Mercer 1997; O`Toole 1999; Price 1998).

But alongside the general upward development of the air transport sector go increasing environmental concerns opposing this growth. Those concerns refer primarily to the number of citizens affected by aircraft noise and emissions but also to the consumption of land by the development of air- and landside facilities including access roads. This holds especially true when it comes to additional runway capacity. Strengthening market incentives in terms of taxation and setting of charges is clearly one way to improve environmental performance (ACI Europe 2000a, b).

Airports are also an important factor for the economic and social development of the regions they serve. Therefore it is crucial to ensure that the local community benefits from successful operations. This includes the advantages that air service accessibility passes on to regional business interests and consumers in providing essential infrastructure. Furthermore, airports represent commercial entities in their own right, stimulating growth, employment and prosperity. Since airports are politically sensitive, creating a 'virtuous circle' – whereby the wealth generated by the airport is shared with the neighbourhood – may be applied as a strategy to address environmental concerns (ACI Europe 1999, 2004).

Figure 1.1 summarizes factors influencing the performance of European airports.

Figure 1.1: Factors Influencing the Performance of European Commercial Airports



Airports have developed in response to the fast growth of the world`s airline industry. In Europe, the demand for air travel has risen three-fold between 1980 and 2000 and is likely to double again by 2020. Moreover, airports are also gradually becoming integrated to the overall transport system in any one country, increasingly linked to the high speed rail and road networks. Thus, the role of airports within the transport infrastructure is becoming more and more important. Traffic growth will result in a massive increase in demand throughout the entire air traffic system. Airports must provide capacity to meet this tough deadline, or delays will reach unacceptable levels. Many airports, however, cannot cope with the increases in traffic volume unless substantial investment is made which needs to be financed via the private sector, which is demanding adequate returns. And together with the progressive globalisation and deregulation of the airline industry, there may also be a concurrent progressive globalisation of the airport industry (ACI Europe 2003c; IATA 2003; Organisation for Economic Co-Operation and Development, OECD, 1997; Reynolds-Feighan & Button 1999; Rolls-Royce 2001; Salomon Brothers 1996; Union Bank of Switzerland, UBS, 1996).

## 1.4 Structure of the Thesis

The structure of the present study after this general introduction is as follows: Chapter 2 is reviewing related literature on and studies in the field. Chapter 3 is formally stating the hypotheses and posing the research question resulting from the setting of the topic and review of the body of research. Chapter 4 is describing the methodology and introducing to the background of empirical work. Chapter 5 is presenting and discussing the results of the analysis of the productive efficiency and financial performance of European commercial airports. Chapter 6 is providing descriptive statistics grouped according to ownership structure and testing the hypotheses based on the results of the preceding data analysis. Chapter 7 is presenting additional interpretation concerning the

research question for key success factors and the valuation of an airport business, including an excursus on the share price performance of listed sample airports. Furthermore, an airport business model will be derived. Chapter 8 is summarizing the main findings and concluding with a discussion of implications and finally indicating areas for further research.

# CHAPTER 2

# REVIEW OF RELATED LITERATURE AND RESEARCH

## 2.1 Relevant Economic Principles and Theories

### 2.1.1 Concepts and Approaches to Privatisation

#### 2.1.1.1 The Impact of Privatisation

Privatisation policies have increasingly been in progress all over the world for almost three decades. Meanwhile it has clearly become a focal point of the global move towards more competitive market economies, including the former Eastern Block. Industries which have been subject of economic regulation in the United States have more commonly been government-owned in other countries. Like the US deregulation movement has intended to diminish economic regulation, the European privatisation efforts have sought to transfer the ownership of public enterprises to the private sector. While privatisation generally aims at unregulated markets, it replaces state ownership by economic regulation in some cases (OECD 1998; Vickers & Yarrow 1988).

There are some good reasons why the ownership of a company has significant impact on its behaviour and performance, since changes in property rights alter the structure of incentives faced by the decision makers. Because ownership, competition and regulation are such interrelated determinants of corporate incentives and behaviour, it is hardly possible to formulate general propositions with regard to the respective merits of private and public ownership. Theoretical analyses as well as empirical evidence, however, support the view that private ownership is most efficient – also in the aviation industry. And hence privatisation is most suitable in those markets where effective – actual or potential – competition prevails (Al-Jazzaf 1999; Backx, Carney & Gedajlovic 2002; Martin & Parker 1997; OECD 1998; Vickers & Yarrow 1988).

In principle, privatisation is characterized by the change of ownership and transfer of property from a government agency to private investors. In this context, the attributes

of mixed ownership models and/or only limited transfer of ownership rights represent an interesting blend. Hybrid public private partnership could provide an opportunity to benefit from the best qualities of public and private ownership. Moreover, governments often pursue large-scale privatisation programmes and their credibility as a seller matters in realizing the fair value of an asset. Especially when the subsequent performance and value of a firm is influenced via regulation, as it is the case regarding airports. Weak post-privatisation performance attributable to government opportunism may result in reduced interest in future projects (Advani 1998; Backx et al 2002; De Neufville & Odoni 2003).

Most European governments are facing increasingly severe fiscal crises and a successful European Economic and Monetary Union demands for further reductions of budget deficits. In order to meet investment requirements and to increase competitiveness and sector efficiency for successful participation in emerging global markets, private sector involvement in infrastructure is regarded a key element of economic growth strategies world-wide (Kapur 1996, 1997; OECD 1997; SBC Warburg 1996a, 1997b; UBS 1996).

Although most airports world-wide are still owned and operated by the respective governmental units, a strong current tendency to experiment with more private sector modes of management and operations is emerging. And Europe, especially the United Kingdom, clearly appears to be the trend-setter in this respect. Changes in the ownership structure are indispensable for overcoming the biggest shortcomings of publicly owned commercial airports: The potential for political interference in management and operations and restrictions on access to management know-how and private capital. But for the time being, most divestitures are rather site-specific and rarely occur within an integrated strategy for restructuring and privatisation of an entire national system (Freathy & O'Connell 1998; Gómez-Ibánez & Meyer 1993; Kapur 1996, 1997; Skapinker 1998).

Figure 2.1 illustrates the process of change in the ownership structure and gives examples of the respective stages in selected European countries.

Figure 2.1 Airport Ownership: An Evolutionary Process

**Evolution towards Private Sector**

| Government Department | Public Corporation | Local & Regional Govt. Ownership | Joint Public-Private Venture | Private Ownership |
|---|---|---|---|---|
| • Greece<br>• Sweden | • Germany<br>• Spain<br>• Portugal<br>• Netherlands<br>• France (Aeroports de Paris) | • United Kingdom<br>• France (some provincial airports) | <u>Flotation</u><br>• Copenhagen<br>• Vienna<br>• Frankfurt<br>• Zurich<br><u>Co-Ownership (PPP)</u><br>• Hamburg<br>• Dusseldorf<br>• Bristol | <u>Flotation</u><br>• BAA<br><u>Trade Sale</u><br>• East Midlands<br>• Cardiff<br><u>Concession</u><br>• Luton |

Source: Illustration adapted from Salomon Brothers 1996

Europe is moving towards changing the ownership structure of its airports at individual phases in an evolution from state-owned and operated utilities to fully commercial private enterprises. Each country's system is at a different point on the continuum, stretching from government ownership to public corporation, to shared government ownership, to mixed public-private ownership and ultimately privately owned businesses (Salomon Brothers 1996; Gangl 1999; Kapur 1995, 1996).

### 2.1.1.2 Types and Examples of Airport Privatisation

The experience in transferring airports from the public to the private sector gained in the United Kingdom, Australia and elsewhere show that the complexity of the process does not allow for a single method of privatising airport operations in the struggle to meet the expectations of all stakeholders involved – investors, national governments, local communities, airlines and old and new airport management. Table 2.1 summarizes the main methods and criteria of airport privatisation which may be adopted, varying under the prevailing conditions (Dempsey 2000; Deutsche Bank 1999; Watson & Beeby 2002).

Table 2.1: Forms of Airport Privatisation

| **Concession** | **Criteria** | **Examples** |
|---|---|---|
| Purchase of a concession to run the airport for a defined period | • Upfront payment<br>• Option for renewal<br>• Responsibility for operations and future investment<br>• Concessionaire takes full economic risk | • **Mexico** 15 years - AENA consortium<br>• **Chile** 15 years - YVRAS consortium<br>• **Tanzania** 25 years - M. Macdonald cons.<br>• **Peru** 20 years - Fraport consortium<br>• **Oman** 25 years - BAA consortium<br>• **Malta** 30 years - VIE consortium |
| **Build, Operate, Transfer (BOT)** | **Criteria** | **Examples** |
| Franchise to build and operate the airport or parts of it for a defined period and then transfer the facility back to the owner | • No upfront payment<br>• Operator retains all revenues, bears all costs and builds the facility<br>• Operator takes full economic risk for investment and operations | • **Athens, Greece**<br>Greek State/HochTief - 30 years<br>• **Manila, Philippines**<br>Fraport consortium - 25 years<br>• **New York, JFK, USA**<br>Schiphol consortium - 20 years<br>• **Sharm El Sheikh, Egypt**<br>YVRAS consortium - 25 years |
| **Management Contract** | **Criteria** | **Examples** |
| Government/ municipality grants a management contract to operate the airport or parts of it for a defined period of time | • Ownership remains with Government/municipality<br>• Remuneration based on fixed as well as result oriented fee<br>• Manager splits economic risk with owners<br>• Investments are made by the owners<br>• Option for renewal | • **BAA** - Pittsburgh, Boston, Indianapolis and Mauritius<br>• **AENA** - Cuba and Columbia<br>• **AGI/TBI** - Burbeck, Albany, Atlanta<br>• **AerRianta** - duty-free operations at airports in Russia and Middle East<br>• **YVRAS** - Bermuda, Cook Islands, Turks and Caicos Islands<br>• **ADP** - Cameroon and Madagascar |
| **Share flotation** | **Criteria** | **Examples** |
| Government/ municipality sells airport shares fully or partially through an IPO (Initial Public Offering) – the shares are traded at one or more stock exchanges | • Government/municipality gives up total or partial ownership<br>• Private sector (institutional investors and the public) own airport shares<br>• Airport company management is responsible for operations, profitability and investment<br>• Shareholders take the full economic risks | • **BAA** - 100% IPO (1987)<br>• **VIE** - 27% IPO (1992)<br>- 21% secondary offering (1995)<br>- further offering (2001)<br>• **CPH** - 25% IPO (1994)<br>- 24% secondary offering (1996)<br>- 17% further offering (2000)<br>• **Auckland, New Zealand**-52% IPO (1998)<br>• **BCIA, China** - 35% IPO (2000)<br>• **FRA** - 29% IPO (2001) |
| **Trade sale** | **Criteria** | **Examples** |
| Government/ municipality sells airport shares fully or partially to a strategic partner with the option of an immediate or later share flotation | • Strategic interest prevails over financial interests<br>• Major incentive is the know-how transfer from the strategic partner<br>• Strategic partner has operational dominance through management contract<br>• Strategic partner shares economic risk with the remaining shareholders | • **Sanford, Orlando**<br>TBI 100% stake<br>• **Wellington, New Zealand**<br>Infratil 66% stake<br>• **South Africa**<br>ADRI South Africa consortium 20% stake<br>(ADR had 69% stake)<br>• **Humberside, UK**<br>MAN 83% stake<br>• **Hamburg, Germany**<br>HochTief/AerRianta consortium 49% stake |

Source: Bentley 2002; Colella 1998; Gangl 2002, Graham 2003

The external challenges described above will further gain momentum and increasingly force the public sector and airport authorities at an accelerated pace to review and restructure existing ownership patterns, management practices and regulatory structures. Moreover, there is an urgent need for a coherent, integrated airport privatisation strategy. Required is a strategic framework that provides a blueprint for capturing the potential economic benefits of the airport sector to the individual economy and to stimulate private sector involvement. Both governments and regulators will need to be commercially reasonable in setting encouraging regulatory structures (Deutsche Bank 1999; Kapur 1995, 1996, 1997; OECD 1997).

Nevertheless, whatever model of the numerous privatisation and financing approaches will be realised, a much better grasp of the airport business will be needed, especially with regard to pricing and revenue performance, but also as far as cost effective management and finance is concerned. Historically, airports have relied heavily on public funding and to a lesser extent on internally generated funds and commercial loans. If private sector participation shall be facilitated as one means to meet the future challenges facing the aviation sector, attractive returns on investment are a prerequisite (Freud 1995; Kapur 1996, 1997; Teitelbaum 1996).

The private sector will only participate in airport financing if returns are favourable in comparison to alternative capital projects. Investors demand evidence that airports are allowed to operate cost effectively, develop innovative strategies and create and tap broad new sources of revenue. Therefore, airports will have to focus on being commercial companies instead of quasi-monopoly state bodies managing air transport infrastructure. Also, the operations of airport companies must no longer be restricted to their national boundaries but need to expand overseas in order to take full advantage of the market potential (Gangl 1999; Salomon Brothers 1996; SBC Warburg 1995, 1996b, 1997b; UBS 1996).

For the time being, there are only a few publicly quoted airport companies in the world, including European Aeroporti di Roma (currently delisted since 2001), BAA plc. Copenhagen Airports, Fraport, TBI plc, Vienna International and Unique Zurich. In Australasia, Auckland International, Beijing Capital International and Malaysia Airports Behrad went public. The European examples had initiated a global movement towards airport corporatisation, commercialisation and ultimately privatisation (Baker 2003).

Indispensable expansion of facilities to accommodate the growth in air traffic as well as ceasing government funding of infrastructure development have been major drivers of the wave of airport privatisations. Even after the well-known setbacks between 2001 and 2003, the long-term projected growth remains basically intact. Around 5% per annum, this will result in a doubling of traffic approximately every fifteen years. Together with requirements caused by the generation of new large aircraft this will drive the demand for expansion and improvement (Airbus 2003; Boeing 2003; De Neufville & Odoni 2003).

On a global basis, privatisation deals have been sealed during the '90s in countries such as Argentina, South Africa, Australia, Germany, Italy, Mexico, Costa Rica and Uruguay, as listed in Table 2.2 below. Several other projects including Amsterdam in the Netherlands, Brussels in Belgium, or Milan in Italy, are in the pipeline for quite a while already, but have not yet materialized since activities in the sector slowed down immediately following September 11 (Aviation Strategy 2003; Baker 2003).

Around the turn of the century, a secondary market in airport acquisitions started developing. UK's regional Liverpool and Bristol airports, for example, have been sold on by British Aerospace and FirstGroup, those companies which first purchased them at privatisation. East Midlands and Bournemouth followed in 2001, as National Express focused again on its core rail and bus operations. In general, the originally quite radical politics of sweeping privatisation has to a large extent been replaced by the more moderate public private partnership (PPP) initiative (Aviation Strategy 2003; O'Connor 2002, May).

Table 2.2 renders airport privatisation projects of the past on a world-wide basis up to the end of 2003, which in parallel led to the emergence of global airport groupings:

Table 2.2: Airport Privatisation Projects and Emerging Global Groupings

| |
|---|
| **ABB (Equity Ventures), Switzerland**<br>• Athens (Greece) • Kruger Mpumalanga (South Africa) • Salalah, Seeb (Oman) • Sharm el Sheikh (Egypt) • San José (Costa Rica) |
| **AENA, Spain** [*still in the public sector*]<br>• Mexico II – Pacific Group (12 airports) • Barranquilla, Cartagena de Indias, Cali (Colombia) • Cayo Coco (Cuba) |
| **Aeroporti di Roma, Italy**<br>• Airports Company South Africa (11 airports) • Genoa, Calabrese (Italy) |
| **Aeroportos de Portugal SA (ANA), Portugal** [*still in the public sector*]<br>• Retail management/hotels at several airports world-wide • Macao (China) • New Lisbon International (Portugal) |
| **Aéroports de Montréal (AdM), Canada** [*still in the public sector*]<br>• International Terminal Budapest (Hungary) • Vatry-Europort (France) |
| **Aeroports de Paris, France** [*still in the public sector*]<br>• Aeroports de Cameroon, 7 airports (Africa) • Beijing (China) • Conakry (Guinea) • Liège (Belgium) • Madagascar, 12 airports (Africa) • Marsa Alam (Egypt) • Mexico III – North Central Group (13 airports) • Siam Reap, Phnom Penh (Cambodia) • St. Petersburg (Russia) |
| **AerRianta Group, Ireland** [*still in the public sector*]<br>• Birmingham (UK) • Dusseldorf, Hamburg (Germany) • Sofia Airport (Bulgaria) |
| **Alterra Partners (Bechtel & Singapore Changi), USA**<br>• Luton (UK) • Lima (Peru) • Curacao International Airport (Netherlands Antilles) • Juan Santa Maria International Airport (Costa Rica) |
| **BAA, UK**<br>• Alice Springs, Darwin, Launceston, Melbourne, Perth, Tennant Creek (Australia) • Naples (Italy) • Indianapolis, Newark, Pittsburgh, Boston Logan (USA) • Salalah, Seeb (Oman) • Mauritius |
| **Copenhagen Airport, Denmark**<br>• Mexico I – South East Group (9 airports) • Newcastle (UK) • Rygge (Norway) • Meilan (China) |
| **Ferrovial, Spain (subsidiary: Cintra, Concesiones de Infraestructuras de Transporte)**<br>• Belfast City Airport, Bristol Airport (UK) • Sydney (Australia) •Cerro Moreno Antofagata (Chile) • Mexico I – Southeast Group (9 airports) • Niagara Falls (USA) |
| **Fraport, Germany**<br>• Hahn, Hanover, Saarbrucken (Germany) • Antalya (Turkey) • Lima (Peru) • Manila (Philippines) • Hong Kong • Ground handling and baggage cart operator at several airports in Europe and USA • Athens (Greece) • Brisbane (Australia) |
| **Hastings Funds, Australia**<br>• Alice Springs, Brisbane, Darwin, Launceston, Melbourne, Perth, Tennant Creek (Australia) |
| **HochTief Airports, Germany**<br>• Athens (Greece) • Dusseldorf, Hamburg (Germany) • Sydney (Australia) |
| **Infratil (Morrison & Co), New Zealand**<br>• Prestwick (UK) • Wellington (New Zealand) |
| **Macquarie Airports Group, Australia**<br>• Birmingham, Bristol (UK) • Sydney (Australia) • Aeroporti di Roma (Italy) |
| **Malaysia (Airports) Berhad, Malaysia**<br>• Siam Reap, Phnom Penh (Cambodia) |
| **Manchester, UK** [*still in the public sector*]<br>• Bournemouth, East Midlands, Humberside (UK) |

Table 2.2: Airport Privatisation Projects and Emerging Global Groupings (cont'd)

| |
|---|
| **Milan SEA, Italy** [*still in the public sector*]<br>• Aeropuertos Argentina (33 airports) • Bergamo, Naples, Orio Al Serio, Rimini (Italy)<br>• Minority shareholder Turin (Italy) |
| **Ogden Corporation, UK/US**<br>• Macao (China) • Partner in Argentina Airports 2000 |
| **Peel Holdings, UK**<br>• Doncaster Finningley, Liverpool, Sheffield, Teesside (UK) |
| **SAGAT (Turin Airport), Italy** [*still in the public sector*]<br>• Florence (Italy) |
| **Schiphol Group, Netherlands** [*still in the public sector*]<br>• Angkasa Pura (Indonesia) • Brisbane (Australia) • Eindhoven, Lelystad, Rotterdam (Netherlands) • Hong Kong • New York JFK International Terminal (USA) |
| **TBI, UK**<br>• Hobart (Australia) • Orlando-Sandford (USA) • Bolivian Airport System (3 airports)<br>• Belfast, Cardiff, Luton (UK) • Ciudad Real (Spain) • San José (Costa Rica) • Stockholm (Sweden) • (equity stakes/management contracts at 30 airports world-wide) |
| **Vancouver Airport Services (YVRAS), Canada** [*still in the public sector*]<br>• Santiago de Chile • Sharm el Sheikh (Egypt) • Cranbrook, Moncton, Fort St. John, Kamloops (Canada) • Montego Bay (Jamaica) • Dominican Republic (4 airports)<br>• Providenciales (Turks and Caicos Islands) • Rarotonga, Aitutaki (Cook Islands)<br>• Montevideo (Uruguay) • Wellington, Hamilton (New Zealand) • Bermuda |
| **Vienna Airport, Austria**<br>• Don Quijote Airport (La Mancha, Spain) • Malta International Airporti (Malta) |
| **VINCI Airports, France**<br>• Beijing (China) • Liège (Belgium) • Mexico I - South East Group (9 airports) • Mexico III - North Central Group (13 airports) • Marsa Alam (Egypt) • Phnom Penh (Cambodia)<br>• Grenoble International (France) • ADP Management (France) |
| **Wiggins Group, UK**<br>• Cuneo Levaldigi (Italy) • Lahr, Schwerin-Parchim (Germany) • London Manston, Kent (UK) • Odense (Denmark) • Pilsen (Czech Republic) • Smyrna, Melbourne (USA) |
| **Zurich Unique, Switzerland**<br>• Calama, La Serena, Puerto Montt (Chile) • Bangalore (India) |

Source: Aviation Strategy 1999; Bates & Tyler 2000; Bentley 2002; Colella 1998; Dempsey 2000; Gangl 2002; Graham 2003; Mountford 2001; Mountford & McNamee 2003; Sowter 2000

It is worthwhile noting that several entities participating in privatisation projects are still in the public sector themselves. Besides the examples above, additional European projects of a possible partial or full privatisation are being contemplated for the near future regarding Geneva, Switzerland, Schiphol Group, Netherlands, Aeroports de Paris, France, AerRianta, Ireland, Budapest, Hungary, Bourgas and Varna, Bulgaria, and Bratislava and Kosice in Slovakia. In Asia, for example, Bangkok, Thailand, Bali, Indonesia, New Delhi and Mumbai Airports, India, as well as Hong Kong and Guangzhou Airports in China, are said to be planning for privatisation in one of the above-mentioned forms. Elsewhere, regional Bankstown, Camden and Hoxton Park in Australia are for sale and Guayaquil,

Ecuador, tendered a concession recently. However, these are just major projects made public and there are many other smaller projects also under review for a change in ownership. As the processes tend to be extremely affected by local conditions – in particular meeting the respective political objectives – the course of action is difficult to foresee (Aviation Strategy 2003; Baker 2003).

Traditionally, airport competition was restricted to those in close geographical proximity and to a limited number of hubs competing for transfer passengers. Nowadays, international expansion is regarded as an important strategy by many operators to grow and diversify their asset portfolio geographically and leverage their management skills by providing cost effective airside operations and enhancing sources for non-aeronautical revenue. AENA, Aeroports de Paris, BAA plc, Copenhagen, Fraport, TBI plc and more recently HochTief Airports, constitute the leading group of operators which was most successful in bidding for international opportunities. TBI exclusively focused on its global airports holdings following the acquisition of AGI Inc. in late 1999. A secondary group pursuing international activities includes AerRianta, Aeroporti di Roma and Milan. Increasing competition in the global arena is additionally intensified by the fact that new players like contractors and construction companies have been attracted to this field. They have been drawn from areas of activity which are not traditionally associated with airport operations, in order to diversify into concession-type businesses which are less cyclical and earn higher margins and even bear the chance of lucrative infrastructure projects. This third group comprises amongst others Bechtel and Vinci Airports. Furthermore, specialised equity funds and institutional investors such as Infratil or Macquarie Airports Group (via Macquarie Bank, its investment fund Macquarie Airports and its Global Infrastructure Fund) have been attracted by the growth-utility profile of airport investments generating strong and steady cash flows, while others stemming from the transport sector like Stagecoach or National Express left the market. As a matter of fact, Macquarie Bank has

been the most active over the last few years with transactions regarding Sydney, Rome. Birmingham and Bristol (Aviation Strategy 2003; Baker 2003; Bates & Tyler 2000; Deutsche Bank 1999; Jane's Airport Review 2003; Sowter 2000).

### 2.1.1.3 Airport Commercialisation and Privatisation

Since aviation income is usually subject to regulation, privatisation is generally stimulating the development of additional revenue sources. This holds especially true for retailing, which is the single largest opportunity, whilst ground handling was deregulated by the EC directive on liberalisation (ABN-AMRO 1998; Feldman, D., 1996).

Airport revenue is classified into aeronautical or aviation and non-aeronautical or commercial revenue. The first category comprises those sources of income arising directly from the operation of aircraft and processing of passengers as well as freight. Non-aeronautical revenues, in contrast, are typically generated by all kinds of commercial activities within the terminal and rents for terminal space and airport land (Doganis 1992; Graham 1997).

The advent of privatisation to the sector resulted in a growing awareness of the commercial potential an airport can offer and many companies are reinventing their business concept. Capitalising on the passenger growth, some have grown into economic centres conducting a variety of activities and providing a wide range of services. Airports are no longer only regarded as modal interfaces but also as leisure attractions and primary attractions of their own right; the 'airport city', global gateways for tourism, commerce and industry. The antiquated break-even goal has been replaced by clear profit orientation. And this new commercialism also applies to regional and downtown airports which are emerging as a low cost alternative to congested and expensive hubs. They are supporting the privatisation tendencies as a means of funding their ambitions and retaining cost advantages. Generally, airports are being realized as corporations or private sector

companies as opposed to state authorities, as business enterprises in contrast to infrastructure providers, and also as an attractive investment opportunity. And even airports which are totally publicly owned are increasingly being run as competitive businesses (Bates 2001; Endres & Yates 1998; Freathy & O'Connell 1998; Gill & O'Toole 1998; Graham 1998; Humphreys 2003; LeTourneur 2001; Mercer 1997).

Airports have traditionally been operated as government funded non-profit public utilities, lacking commercial incentives. In the process towards privatisation, corporatisation is a first step. Although all shares are still with the public sector, the airport's assets and management are incorporated to form a company run on commercial lines. The essential step, however, is commercialisation, demonstrating the ability of delivering sustainable growth, improved efficiencies and profitability. Usually it starts out by focussing on cost savings followed by enhancement of aviation and, of course, commercial revenue. Commercialisation does not necessarily have to lead to privatisation, particularly when better value for money is delivered to the public sector, releasing sufficient funds for future infrastructure development. AerRianta, Amsterdam Schiphol, Fraport before its partial privatisation in 2001, and Manchester are examples of companies successfully run on commercial terms by public sector shareholders, finally resulting in equity stakes in already privatised airport companies (Deutsche Bank 1999; Humphreys 2003).

The balance between financial expectations from commercial activities, especially retail and aeronautical charges, are key to the business structure of airport privatisation projects. Non-aeronautical revenue showed strong growth where more entrepreneurial business strategies were adopted, which typically involves maximising primarily rental and concession revenue from retail sales, parking facilities and property (Ashman 2000; Behnke 2000).

The importance of commercial revenue is ever-increasing, since this is usually the area of greatest potential revenue increase due to the combined effects of underlying traffic growth and increased spend per passenger. In general, commercial activities generate additional non-regulated revenue which improve overall profitability. Operational problems after the abolition of intra-EU duty-free had shaken investor confidence in the sector, but per passenger sales recovered in the meantime. Still, the overall opportunity for profit growth from commercial activities remains significant but different, due to the wide spread in the base of concessionary income (Ashman 2000; Dresdner Kleinwort Wasserstein 2004; Pilling 2002; Schroder Salomon Smith Barney 2002; Watson & Beeby 2002).

#### 2.1.1.4 Excursus: The US Experience

Although accounting for half of the world's air passenger throughput, there is no significant privatisation in North America beyond private sector involvement in terminal developments for domestic carriers, despite the US Federal Airport Privatisation Pilot Programme launched by Congress in 1996. Much of the travelling public and the airline industry are still worried by this development, bearing the threat of increasing airport charges and ultimately higher ticket fares after privatisation (Colella 1998; Gómez-Ibánez & Meyer 1993; Hazel 1995; Kaps 2000; Kurland 1998).

Due to available sources of finance and the particular renting/leasing practices, some unique administrative and financial characteristics differentiate US airports from those elsewhere. Besides internally generated cash flow the financing system includes a combination of Passenger Facility Charges (PFCs) assessed on passengers, funds from the Airport Improvement Program (AIP) and bonds, the interest of which is exempt from federal taxes. The main difference, however, arises due to the relatively high level of customer involvement. The generally publicly owned airports are operated in close

conjunction with privately owned airlines. This means that at some airports the airlines share the financial risk of airport operation and investment (De Neufville & Odoni 2003; Graham 1996b, 1999b; Kaps 2000; Ward 1998).

In the US, airports and airlines enter into legally binding contracts, the airport use agreements. These detail the conditions for the use of airfield and terminal facilities and specify the fees and rental rates and the applicable calculation method: Residual or compensatory. In the Majority-in-Interest clauses the use agreements usually rule a significant airline role in the decision making process of airport investments (Butler & Keller 1995; De Neufville & Odoni 2003; Graham 1996b, 1999b; Kaps 2000; Wells 1996).

Moreover, medium-sized and large hub airports are often regarded as the crown jewel of a municipality, stimulating the regional economy and generating employment. Sources of funding include grants and bonds. Many airports are partly or even largely financed by the private sector via the bond market. In addition, they can apply for funds from the Airport Improvement Programme and from Passenger Facility Charges (Button, Lall, Stough & Trice 1999; Feldman, J. M., 1999; Horonjeff & McKelvey 1994; Kaps 2000; Kurland 1998; Pino & Fischbeck 1995).

Thus, the private market is already involved in US airports which have actually ceded a considerable degree of management control. The approach, though, is different from the privatisation models in other areas of the world, since the combination of grant assistance and access to the bond market provides the necessary capital. From this perspective, publicly owned US airports may already be considered amongst the most privatised in the world. And further moves in terms of private equity stakes could mean a convenient way of generating additional income for many of the respective municipalities. In order to attain effective privatisation, however, several issues including repayment of AIP grants, abolishment of PFCs and taxation of property needed to be resolved (De Neufville & Odoni 2003; Kurland 1998; McCormick 2000; Stanmeyer & Cote 1995).

### 2.1.2 Concepts and Approaches of Performance Measurement

As described above, the sector is currently characterised by a high level of corporate activity which is resulting in an unprecedented stage of investor interest in gaining exposure to the dependable and growth characteristics of airport investments. Alongside with this trend goes an increasing interest in monitoring and comparing the performance and assessing the relative attractiveness of airports (ABN-AMRO 1998).

Every time an airport sounds mildly interested in privatising, financial institutions seeking underwriting and advisory fees, construction and consulting companies, other interested airports themselves and other firms involved line up to investigate. This interest is easy to understand. Revenue from fees and concessions are rather steady, stable and almost risk-free (Feldman, J. M., 1997; SBC Warburg 1996a, 1997b).

Europe's airports seem to emerge as attractive investment opportunities for the private sector: Airports are large businesses, providing a complete range of essential services to a broad customer base. They represent a growth business which is relatively recession-proof and commands premiums. They are essentially monopoly suppliers with little real competition in the local marketplace and high entry barriers. They are high-utilization assets, in use 365 days a year. While short-distance travellers may increasingly opt for high-speed rail links, long-haul passengers can be viewed as captive to the traffic mode. Although they may have a choice between competing airports for some destinations, they will be using the air transport system – and demand is growing rapidly. In short, the low competitive intensity of the industry makes airports structurally attractive as investments because the expected earnings are likely to be favourable and above average (ABN-AMRO 1998; Favotto 1998/1999; SBC Warburg 1996b, 1997a).

With the new approach of the airport business there is an increasing interest in monitoring and comparing the performance of individual airports. Performance measures generally describe the relationship between inputs and outputs. As with any other business,

labour and capital obviously are the major inputs of an airport. These can be measured in financial (e.g. labour and capital costs etc.) or physical (e.g. number of employees, productive capacity) terms. The outputs can either be measured as work load units (WLUs) or in terms of total revenue or value added. The work load unit is a standard gauge of output combining both passengers and freight. It is defined as one terminal passenger or 100kg of air cargo. Several combinations of the measures above reveal different ratios covering certain areas of economic performance. They include cost performance, labour and capital productivity, revenue generation, commercial performance and profitability (Doganis 1992; Francis, Humphreys, & Fry 2002; Graham 1998, 1999a; Pilling 2002).

The areas of primary interest obviously differ as the particular focus does. Airport managers concentrate on operational aspects, so as to understand how efficiently the airport is using its infrastructure and how cost effectively it is doing so. The finance sector is more interested in comparative levels of commercial revenue and its relationship to aeronautical revenue, liquidity ratios and capital expenditure levels. Those advising investors will definitely look at a wide range of measures covering all aspects of performance, in order to judge on the potential for performance improvements once an airport has been privatised (Mackenzie-Williams 1998).

The two basic ways in which performance indicators can be used relate to the comparative performance of a selected group of airports, which allows assessment of how well an individual airport measures up against others; or to the application to a single company over a period of time, to monitor the progress of particular aspects of the business and/or operations (Graham 1998; Mackenzie-Williams 1998).

Two basic approaches of performance indicators are partial versus total measures. While partial or partial factor productivity (PFP) measures examine the relationship between one or more inputs (e.g. labour, capital etc.) and one or more outputs (e.g. passengers, freight etc.), total factor productivity (TFP) and thus data envelopment analysis

(DEA) are producing an overall measurement of the combined factor inputs in relation to the total output produced (Hooper & Hensher 1998; Oum & Yu 1998; STM 1998; Transport Research Laboratory, TRL, 1999; Waters 1998).

One reason why airport benchmarking has taken a long time to become accepted is the fact that several issues make comparisons difficult: Different accounting policies, affecting depreciation and asset valuation; different employment structures and/or different ranges of activities. Most of these differences, however, apply to the airline world as well. And yet airline performance indicators have been published for many years. In the traditionally more competitive airline environment, managers have long been accustomed to use whatever analytical tool available for their advantage. Airports in the public sector tended to lack the commercial pressure and so have not had the same incentive. In addition, meaningful performance appraisal has not been widely practised in the public sector until quite recently (Francis et al 2002; Mackenzie-Williams 1998).

Comparability issues are present in nearly all inter-company benchmarking since variations of the scope of services provided, e.g. ground handling, may have an impact on performance. While one approach of reducing these problems is adjusting the data to a 'normalised' set which represents a hypothetical standard airport, an alternative is an outright comparison of raw data. The most favourable approach is again depending on the very focus which might vary considerably between current owners and management and prospective investors (Graham 1996a, 1999a; Soeda 1999; STM 1998; TRL 1999).

## 2.2 Airport Performance Measurement – A Review of Methods and Studies

This section outlines the different perspectives, techniques and indicators for measuring airport performance. Passenger quality measures will be distinguished from indicators of physical and/or financial performance. Finally the main research applications will be surveyed and several of these will be discussed in some detail.

### 2.2.1 Performance Indicators for Airports

#### 2.2.1.1 The Operational Perspective

From an operational point of view, the airport forms an essential part of the air transport system. It is the physical site at which a modal transfer is made from the air mode to the different land modes. Its operation is commonly divided into airside and landside functions, including aprons and runways, and terminals and ground access facilities (Ashford et al 1997).

The evaluation of airside performance is primarily based on technical capacity in terms of runways, taxiways, aircraft stands and passenger gates. With regard to the landside – passenger terminal buildings and ground access facilities – dwelling time within the terminal, space in terms of square meter per passenger and walking distance to and from the boarding gate have emerged as the relevant dimensions.

Tables A.1.1 and A.1.2 in Appendix A.1, Operational Performance Indicators, summarize indicators for evaluating the performance of the passenger processing system and the service level of ground access facilities.

#### 2.2.1.2 The Marketing Perspective

In contrast to the above-described 'producer's' operational perspective of capacity and services provided, the marketing approach for the design of performance measures is based on the customers' perceptions of quality and service levels (Lemaître 1998).

Passenger satisfaction in terms of convenience, quality and service level standards are the main focus of the marketing perspective of measuring airport success. It is primarily evaluating passenger satisfaction with terminal buildings and airport access, but also connectivity (Adler & Berechman 2000; Lemaître 1998).

Tables A.2.1 and A.2.2 of Appendix A.2, Marketing Performance Indicators, summarize methods and performance indicators for measuring passenger satisfaction in

airport terminals like queuing for processing activities or availability of seats, and for a passenger perception model of airport access such as airport distance and journey time.

#### 2.2.1.3 The Financial Perspective

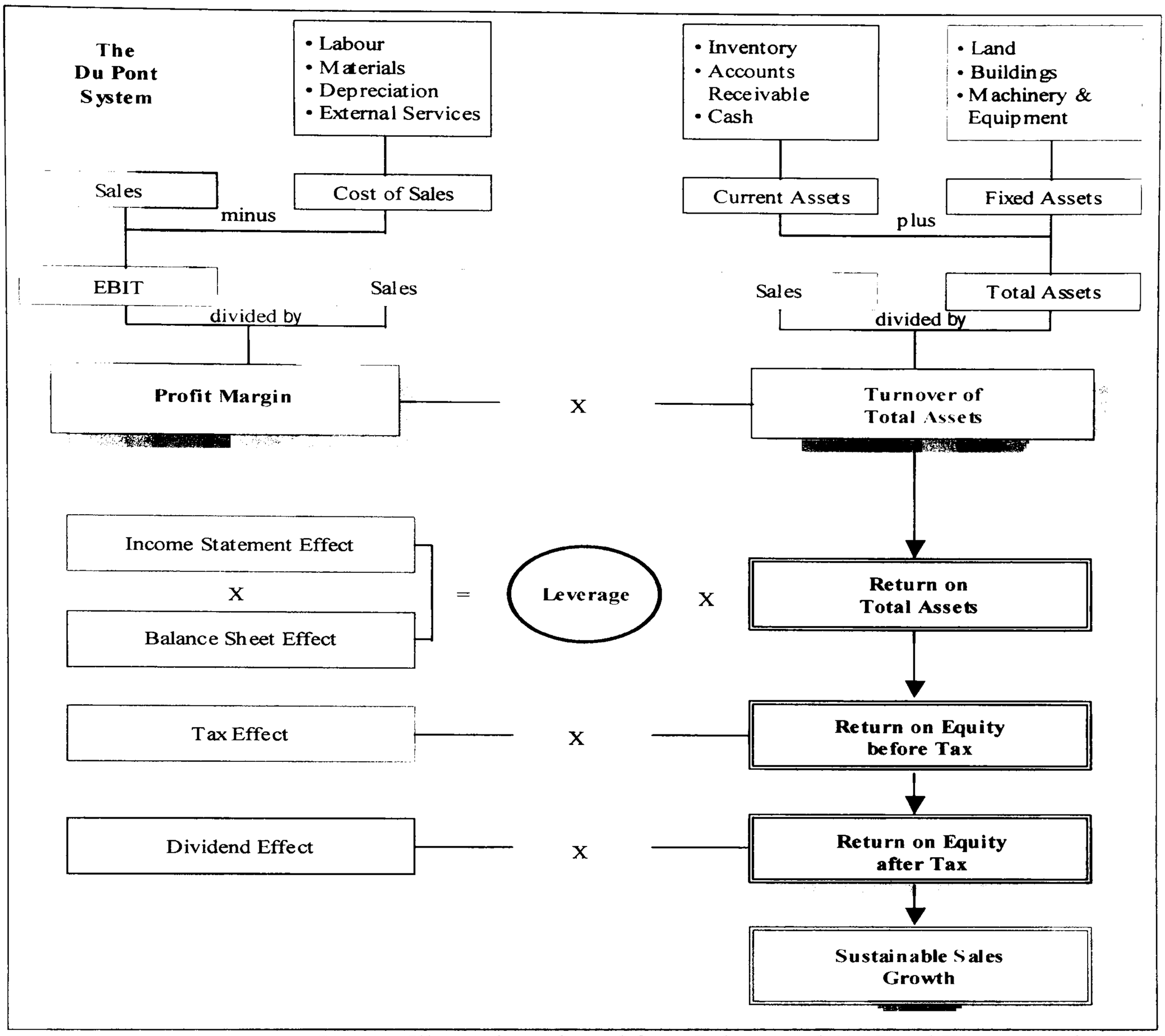
Data appearing in a firm's financial statements are of relevance for various parties interested i.e. in the size, growth, financial strength and profitability of the company in question. The financial perspective is aiming to assess the development of the financial performance of an airport business within a given period of time. Relevant findings can also be compared to industry standard in using it as a benchmark in order to judge on the competitiveness and future prospects as well as to approximate the market value of the company (Palepu, Bernard & Healy 1997; Weston, Besley & Brigham 1996).

##### 2.2.1.3.1 Ratio Analysis - Financial Ratios as a System

Financial statements provide information about a firm's position at a point of time as well as its operations over some past period. However, the real value of financial statements is in the fact that they can be used to help predict the company's financial position in the future. For management, financial analysis is useful both as a way to anticipate future conditions and as a starting point for planning actions that will control the future business development. From an investor's point of view, predicting the future in order to determine expected earnings and dividends is what financial analysis is all about (Weston et al 1996).

The concept of financial ratios as an interdependent system of performance indicators is illustrated in Figure 2.2, commonly called a Du Pont chart. The most common use of the Du Pont system is decomposing return ratios into profit margin and turnover components. The Du Pont chart summarizes the relationships between return on investment (assets), asset turnover, the profit margin and leverage.

Figure 2.2: The Du Pont Chart – Financial Ratios as a System




Source: Illustration adapted from Palepu et al 1997 and Weston et al 1996

The upper left side of the chart develops the profit margin on sales, the right-hand side the company's turnover of assets. Financial leverage in using debt financing, taxes and dividends paid further affect a firm's sustainable sales growth or increase in equity (Palepu et al 1997; Ross, Westerfield & Jaffe 1996; Weston et al 1996).

**2.2.1.3.2 Uses and Limitations of Ratio Analysis**

Financial statement analysis is used to determine the company's financial position in order to identify its current strengths and weaknesses and to suggest actions that might enable the firm to take advantage of its strengths and correct its weaknesses. Ratio analysis is important not only for the firm's managers but also for the potential investors and actual

creditors. Internally, financial managers use the information provided by financial analysis to help make financing and investment decisions to maximize the company's value. Externally, stockholders and creditors use extended financial analysis to evaluate the attractiveness of the firm as an investment by examining its ability to meet its current and expected financial obligations (Damodaran 1996; Ross et al 1996; Van Horne 1998; Weston et al 1996).

The thing that statement users are most interested in is predicting profits. It is profits which provide the basis for an increase in the value of the shareholder's stock and encourage the creditor to risk money in an organization. And it is largely profits that make future expansion possible. The dilemma is that profits are uncertain. Therefore, various ratios assist in interpreting the key relations and trends that serve as a basis for judgments of potential future success (Damodaran 1996; Pike & Neale 1996; Weston et al 1996).

A common classification system of financial ratios comprises five areas of interest: The first grouping of major categories of ratios used in business, the profitability ratios, measure the ability of the firm to earn an adequate return on sales, total assets and invested capital. Many of the problems related to profitability can be explained, in whole or in part, by the firm's ability to employ its resources effectively. The asset turnover ratios measure the speed at which the firm is turning over its assets. For long-term assets, the ratio indicates how productive the fixed assets are in terms of generating sales. The primary emphasis of liquidity ratios is on the company's ability to pay off short-term obligations and the speed at which cash moves through the firm. The debt utilization ratios evaluate the firm's overall debt position in light of its assets base and earning power. The fifth category is market value. It is management's primary goal to maximize shareholder wealth, which translates into maximizing the value of the firm. For quoted companies this value is measured by the price of the respective common stock (Block & Hirt 1994; Damodaran 1996; Ross et al 1996; Van Horne 1998; Weston et al 1996).

Tables A.3.1 – A.3.3 in Appendix A.3, Financial and Economic Performance Indicators, summarize examples of alternative financial indicators as found in the literature. Different users of financial statements, of course, attach different degrees of importance to the individual categories of ratios. To the potential investor or security analyst, the critical consideration is market value and profitability, with secondary consideration given to such matters as liquidity and debt utilization. For the banker or trade creditor, the emphasis shifts to the company's current ability to meet debt obligations. The bondholder, in turn, may be primarily influenced by debt to total assets, while also eyeing profitability in terms of the ability to cover debt obligations (Block & Hirt 1994; Ross et al 1996; Van Horne 1998; Weston et al 1996).

No matter how carefully prepared, all financial statements are essentially historical documents. They tell what has happened during a particular period of time. The most valuable information, however, concerns what probably will happen in the future. The purpose of financial statement analysis is to assist in predicting the future by means of comparison, evaluation and trend analysis (Garrison & Noreen 1994; Ross et al 1996; Van Horne 1998).

Ratios are not sufficient in themselves as a basis for predictions about the future and should not be viewed as an end but rather as a starting point, as indicators of what to pursue in greater depth. They may raise many questions, but rarely answer them by themselves. In addition to looking at ratios, the prospective investor must analyse other relevant data, such as of industry trends, technological changes that are anticipated or in process, changes of regional and national economic factors, in the regulatory framework, changes in key management positions within the firm itself etc., in order to make judgments about the future of an organization (Garrison & Noreen 1994; Ross et al 1996; Van Horne 1998).

Moreover, all findings of such an assessment of company results are derived from financial statements recorded under a specific accounting principle and different taxation regimes. Nevertheless, financial ratio analysis will certainly allow the assessment of results and its trends within a consistent system of an individual firm – and thus relative to its peers over time – while some of the financial measures like EBIT (earnings before interest and taxes) and EBITDA (earnings before interest, taxes, depreciation and amortization) overcome accounting and/or taxation differences and even enable easy comparisons to other business sectors (Damodaran 1996; Palepu et al 1997).

### 2.2.2 Instruments and Techniques for Measuring Economic Efficiency and Productivity

Financial metrics and productivity measures are the two basic quantitative approaches to performance measurement. The first category emphasises profitability or return rates, the investor's focus as described above in the context of financial ratio analysis. The second one refers to the relationship between inputs and outputs and the basic notion of supplying more outputs using fewer inputs (Coelli, Prasada Rao & Battese 1998; Hensher & Waters 1993).

Economic efficiency, generally, relates to (factor) productivity, which is defined as the amount of real output produced by one unit of factor input. Performance is a relative concept and changes in productivity are usually measured over time and comparisons are drawn on an intra-sectoral basis. Indicators of productivity are commonly recognised as a management tool for tracking enterprise performance and also for decision making with regard to further improvement. Deriving appropriate aggregates of input and output, however, is difficult and performance measures may not always be quite clear on what they are measuring (Coelli et al 1998; Hensher 1991; Hooper 1987; Hensher & Waters 1993; Lemaître 1997).

The interest in the performance of transport industries is of long standing. This holds true for investigations of performance determinants at company level as well as for studies of the conditions enhancing productivity increases and the ultimate impact on an economy's overall development (Hooper 1987; Sengupta 1995).

Ideally speaking, benchmarking airport performance needed to take into consideration any issues arising from the differences in the scope of activities performed, service levels, the competitive situation and in regulatory control. Airport profitability is a composite measure, determined by productivity, markets to serve and the respective market power and price regulation mechanisms. Just like common financial reporting also productivity measures may not be exclusively reliable on their own but should rather be applied complementary, given these inherent limitations. And, what is most important from management's as well as from the investor's point of view, both in isolation may not necessarily indicate entirely the potential volume and area for future improvement (Gillen & Lall 1997; Hensher & Waters 1993; Hooper & Hensher 1998; Lemaître 1997).

Therefore, and also because regulating authorities want to avoid underinvestment and declining service standards, there is a need for monitoring and distinguishing service quality and productivity in terms of cost efficiency, cost effectiveness and service effectiveness. Cost or technical efficiency refers to the supply-side relationships of transforming basic physical inputs (e.g. labour, energy, capital, overheads etc.) into intermediate physical services such as operational gate hours. Effectiveness describes demand-side relationships: While cost effectiveness relates to the relationship between basic inputs and final outputs or services consumed (i.e. passenger throughput, number of aircraft landings), the relation of intermediate to consumed services is referred to as service effectiveness (Civil Aviation Authority, CAA, 2000; Gillen & Lall 1997; Hensher & Waters 1993; Hooper & Hensher 1998).

The appropriate productivity measure depends on the purpose of measurement. A number of techniques have been applied to the research on airport measurement and comparison, including the analysis of partial factor productivity, the calculation of total productivity indices, data envelopment analysis and multi-attribute assessment (CAA 2000; Coelli et al 1998; Lemaître 1997; Oum, Tretheway & Waters 1992).

Before turning to some prominent applications to the airport sector, the following paragraphs give a summary review of the main approaches to measuring efficiency.

### 2.2.2.1 Partial Productivity Indicators

Partial factor productivity (PFP) measures the ratio of one or more inputs to one or more outputs, considering subsets of business activities. Disaggregated performance measures constructed from multiple inputs and outputs help to identify and describe the strengths and weaknesses of an airport. In revealing specific areas and/or activities for further improvement, they are very useful to managers monitoring airport operations. Isolated input/output ratios by themselves are not capable of describing the quality of performance but demand a standard of comparison to be meaningful, i.e. a time-series of own or competitors' data (Doganis, Lobbenberg & Graham 1995; Hensher & Waters 1993; Hooper & Hensher 1998).

Indicators for measuring performance which have emerged from studies on European airports include six discrete areas: Overall cost performance, labour productivity, productivity of capital employed, revenue-generating performance, performance of commercial activities and overall profitability. Cross-sectional benchmarking can be facilitated by the construction of performance profiles. These compare individual to average performance by indexing it relative to the average performance indicator, which is set to 100 (Doganis 1992; Doganis & Graham 1987; Doganis & Nuutinen 1983; Graham 1997).

The inherent shortcoming of such indicators as outlined above is that even a variety of performance ratios is incomplete. It may even be misleading when partial measures are considered in isolation and if, for example, the impact of airline traffic mix is not properly taken into consideration in measuring inputs and outputs. The share of origin and destination (O&D) versus transfer passengers might affect commercial revenues considerably. Moreover, they neither take into account factor substitution effects nor do they reflect differences in factor prices (Coelli et al 1998; Gillen & Lall 1997; Oum & Yu 1998; Hensher 1991; Hooper & Hensher 1998; Waters 1998).

#### 2.2.2.2 Total Productivity Measures

The above-mentioned shortcomings of PFP suggest alternative total measures referring to the relationship of the combined factor inputs with the combined output produced, or the growth of total outputs and total inputs. The concept of total factor productivity (TFP) aims at making up for the deficits of PFP and additionally allowing for the possibility of economies of scale and scope effects. The overall TFP performance measure represents cost efficiency and effectiveness in a single index – but not service effectiveness (Coelli et al 1998; Hensher 1991; Hooper & Hensher 1998; Oum & Yu 1998; Waters 1998).

The TFP technique gives a total performance indication because it embraces a multiplicity of inputs and outputs. It is especially adequate for monitoring performance over long periods of time, when the factors causing variations in gross TFP are carefully analysed (Hensher & Waters 1993; Hooper & Hensher 1998).

While PFP measures examine the relationship between one or more inputs (e.g. labour, capital etc.) and one or more outputs (e.g. passengers, freight etc.), TFP and data envelopment analysis (DEA) are producing an overall measurement of the combined factor inputs in relation to the total output produced. DEA is a linear programming technique;

similar to the non-parametric TFP measure it produces a weighted output index relative to a weighted input index (Coelli et al 1998; Gillen & Lall 1997; Graham 1998, 1999a; Graham & Holvad 1997).

#### 2.2.2.2.1 Parametric Total Factor Productivity

In order to identify all inputs and outputs the identification and understanding of all company activities is essential. In complex systems, multiple inputs as well as outputs are involved, which necessitates the construction of input and output indices. A widely used index for the calculation of total factor productivity is the translog multilateral index (TMPI). It may be applied to cross-sectional comparisons, to time series and also throughout a combination of these (Caves, Christensen & Diewert 1982; Hensher & Waters 1993; Lemaître 1997).

This parametric or statistical approach is based on the estimation of a production or cost function which recognises several variables influencing performance. Productivity is then measured as the change of this relationship over time. This statistical estimation allows to incorporate exogenous influences, including institutional and regulatory factors. It also allows to investigate scale and scope economies, factor substitution and price effects (Hensher & Waters 1993; Hooper & Hensher 1998; Waters 1998).

#### 2.2.2.2.2 Non-Parametric Total Factor Productivity

Non-parametric or index number measures may be constructed immediately from the observations. It does not require any assumptions or estimates of the parameters of the underlying production or cost functions. Data on input and output categories are added up to respective indices, while the individual prices serve as the weights applicable to the input and output quantities. The calculated TFP measure then is the ratio of the output versus the input index (Hensher & Waters 1993; Hooper & Hensher 1998).

A multilateral output- or scale-adjusted TFP index allows to compare airports and also to investigate the effects of economies of scale and scope. In this case, the cost shares and cost elasticities or revenue shares, respectively, are appropriate input and output weights. A revenue-weighted TFP index represents gross total factor productivity; although it does not in itself distinguish between the potential causes of relative productivity, the sources of gross total factor productivity (GTFP) variations across airports and/or over time may be explored by additional statistical analysis (Caves et al 1982; Hensher & Waters 1993; Hooper & Hensher 1998).

#### 2.2.2.2.3 Data Envelopment Analysis

DEA is also a non-parametric method of measuring performance, based on a ranking concept of the relative efficiency of a set of decision making units which are engaged in performing the same function. This frontier-efficiency technique does not involve the estimation of underlying production or cost functions. In carrying out so-called dominance comparisons of the production units' inputs and outputs, DEA applies a relative efficiency concept; efficiency is not measured in absolute terms but in relation to the sample. This is stated as a linear programming model originally proposed by Charnes, Cooper and Rhodes, which is solved for a scalar measure of efficiency. The most efficient decision making units (DMU) are located on the frontier or envelope with a relative index of 1.00 (Charnes, Cooper, Lewin & Seiford 1994; Charnes, Cooper & Rhodes 1978; Cooper, Seiford & Tone 2000; Hensher & Waters 1993; Sengupta 1995; Thanassoulis 2001).

In contrast to parametric approaches this is a different principle of gaining information from a population of observations. Like the index number approach to TFP, DEA does not assume a functional relationship between inputs and outputs. It does not assume that all DMUs are technically efficient and is capable of incorporating multiple

input and output factors without the need of weighting these in order to construct composite measures. The flexible treatment of input and output weights so as to maximise the efficiency of each DMU is actually the major advantage of DEA. Its focus on deriving the best-practice frontier and optimising the individual DMU is an alternative approach of organising and analysing data, which may result in new insights. One of the limitations of DEA is, however, its sensitivity to data and parameter selection. When relying on physical input data alone, DEA does not take factor prices or costs of production into consideration and hence cannot be used to analyse cost efficiency. But it may be reasonably applied to such sets of observations where cost measures are replacing physical input measures (Charnes et al 1994; Coelli et al 1998; Cooper et al 2000; Gillen & Lall 1997; Graham 2003; Graham & Holvad 1997; Hensher & Waters 1993; Parker 1999; Sengupta 1995; Thanassoulis 2001).

Charnes, Cooper, Lewin & Seiford emphasise the analytical power of this technique in highlighting that:

"DEA calculations

1. focus on individual observations in contrast to population averages;
2. produce a single aggregate measure for each DMU in terms of its utilization of input factors (independent variables) to produce desired outputs (dependent variables);
3. can simultaneously utilize multiple outputs and multiple inputs with each being stated in different units of measurement;
4. can adjust for exogenous variables;
5. can incorporate categorical (dummy) variables;
6. are value free and do not require specification or knowledge of a priori weights or prices for the inputs or outputs;
7. place no restriction on the functional form of the production relationship;
8. can accommodate judgement when desired;
9. produce specific estimates for desired changes in inputs and/or outputs for projecting DMUs below the efficient frontier onto the efficient frontier;
10. are Pareto optimal;
11. focus on revealed best-practice frontiers rather than on central-tendency properties of frontiers; and
12. satisfy strict equity criteria in the relative evaluation of each DMU" (Charnes et al 1994, pp. 7-8).

This appears to be very suitable to the performance measurement of airports which utilize multiple inputs in generating multiple outputs. Since there is no easily identifiable underlying production function which could be expressed in stringent mathematical terms, the required methodology needs to provide a single efficiency measure encompassing all inputs and outputs. The data analysis will be based on the assumption that airport companies deliberately decide on their individual factor input. All airports use similar inputs to produce the same outputs and hence may be regarded homogeneous decision-making units. The objective is to assess the efficiency of the sample airports in carrying out this transformation process (Adler & Berechman 2000).

#### 2.2.2.2.4 Multi-Attribute Assessment

Based on the experience gained with PFP and DEA, the assessment of airport performance has also been pursued by applying a so-called multi-attribute approach. Like data envelopment analysis, multi-attribute assessment is measuring overall performance by a summary measure rather than a multitude of performance indicators. Similar to DEA models, multi-attribute models are compensatory since smaller values of one attribute can be compensated by larger values of another. In contrast to DEA, however, multi-attribute models are measuring overall performance in combining a number of partial performance measures as a weighted sum of inputs. Each attribute, in turn, is constituted by a performance indicator or ratio in itself, relative to other sample subjects. After normalizing the data, weights need to be assigned which involves the expression of opinion or preference and inevitably the codification of tradeoffs. The fact that different assessors will probably have different preference structures is likely to result in different estimates of performance. While the expression of opinions may be replaced by either using equal weights or the application of probability distributions for the value of each weight, the

problem which distribution to apply will remain – and of course which basic performance measures to include as input variables (Graham 2003; TRL 2001, 2002).

### 2.2.3 Major Applications to the Airport Sector

Numerous academic studies and industry reports on airports were released, which applied various methods of measuring economic efficiency and performance. Since 1998, ACI is publishing a global 'Airports Economics Survey' of its recently more than 400 contributing member airports on an annual basis. It is including some selected partial productivity indicators grouped per geographical region/continent (ACI 1998). In addition, ICAO surveyed a global sample of 252 airports in 1998, summarizing results of a few partial productivity indicators, also grouped per geographical region (ICAO 2000). The fact that in both cases merely little aggregated data per region is provided does not allow for any comparison between sample airports. Furthermore, the number of indicators and area covered is very limited only.

Other related publications are IATA's 'Global Airport Monitor' and 'Global Airport Connectivity Monitor, and ACI's 'Quality of Service at Airports'. These are focusing on identifying dimensions of airport service quality and on measuring quality aspects in terms of the individual perception of services as well as an airport's route network. Exclusively dedicated to the growing contribution of non-aeronautical activities to airport revenue is the 'Airport Retail Study' published by the Centre for Airport Studies (CAS) and updated by Arthur Andersen (CAS 1999; Arthur Andersen 2001).

Table 2.3 below gives a survey of major applications of the previously described techniques for measuring and benchmarking airport efficiency and productivity. Although smaller in average sample size than the global surveys of ACI and ICAO, the studies below list quantitative data on individual airports, lending itself to comparative analysis. Several examples of earlier research on the subject will be reviewed next in some detail.

Table 2.3: Applications of Performance Measurement Techniques to the Airport Sector

| **Methodology / Main Focus** | **Author(s)** | **Empirical Data** |
|---|---|---|
| Partial Productivity Indicators | Doganis & Nuutinen, 1983 | 14 European airports; 1979 |
| Partial Productivity Indicators | Doganis & Graham, 1987 | 24 European airports; 1983 |
| Partial Productivity Indicators | Monopolies and Mergers Commission (MMC), 1991 | BAA airports; 1986-1991 |
| Partial Productivity Indicators | Doganis, 1992 | U.K. and Europe; 1989 |
| Partial Productivity Indicators | Graham & Dennis, 1993 | U.K. and Europe; 1979-1991 |
| Partial Productivity Indicators | Bureau of Industry Economics (BIE), 1994 | 12 airports internationally; 1993 |
| Partial Productivity Indicators | Doganis, Lobbenberg & Graham, 1994 | 24 European, 12 Australian airports; 1992/93 |
| Partial Productivity Indicators | Doganis, Lobbenberg & Graham, 1995 | U.K. and Europe; 1993 |
| Partial Productivity Indicators | Symonds Travers Morgan (STM), 1997; 1998 | 32 airports/airport groups internationally; 95/96; 96/97 |
| Partial Productivity Indicators | Transport Research Laboratory (TRL), annually, 1999ff. | 34 airports/airport groups internationally; 97/98ff. |
| Partial Productivity Indicators/ Total Factor Productivity | Air Transport Research Society (ATRS), annually, 2002ff. | 68 airports/airport groups internationally; 1999ff. |
| Total Factor Productivity | Tolofari, Ashford & Caves, 1990 | BAA airports; 1975/76-1986/87 |
| Total Factor Productivity | Prices Surveillance Authority (PSA), 1993 | 6 Australian airports; 1988/89-1991/92 |
| Total Factor Productivity/ Tornquist Index | Hooper & Hensher, 1998 | 6 Australian airports; 1988/89-1991/92 |
| Multi-Attribute Assessment/ Data Envelopment Analysis | Jessop, 1999 | 32 airports/airport groups internationally; 1996/97 |
| Multi-Attribute Assessment/ Data Envelopment Analysis | Jessop, 2000 | 26 airports/airport groups internationally; 1997/98 |
| Data Envelopment Analysis | Gillen & Cooper, 1994; 1995 | 50 US airports; 1989-1992 |
| Data Envelopment Analysis | Graham & Holvad, 1997 | 25 European, 6 Australian airports; 1992/93 |
| Data Envelopment Analysis | Gillen & Lall, 1997 | 21 US airports; 1989-1993 |
| DEA/Malmquist Index | Gillen & Lall, 1998 | 22 US airports; 1989-1993 |
| DEA/Malmquist Index | Murillo-Melchor, 1999 | 33 AENA airports; 1992-1994 |
| Data Envelopment Analysis | Parker, 1999 | BAA airports; 79/80-95/96 |
| Data Envelopment Analysis | Salazar de la Cruz, 1999 | 16 AENA airports; 1993-1995 |
| Data Envelopment Analysis | Sarkis, 2000 | 44 US airports; 1990-1994 |
| Data Envelopment Analysis | Vasigh & Hamzaee, 2000 | 24 US airports; 1993-1998 |
| DEA/Stochastic Frontier Analysis | Pels, 2000 | 34 European airports; 1997 |
| DEA/Stochastic Frontier Analysis | Pels, Nijkamp & Rietveld, 2001 | 34 European airports; 1995-1997 |
| Data Envelopment Analysis | Martín & Román, 2001 | 37 AENA airports; 1997 |
| Data Envelopment Analysis | Bazargan & Vasigh, 2003 | 45 US airports; 1996-2000 |

### 2.2.3.1 Review of Selected Studies and Reports

Doganis, Nuutinen, Graham & Lobbenberg

Doganis, together with Nuutinen, Graham and Lobbenberg, were amongst the first authors who subjected the performance of airports to scientific research. Over the years, they developed a comprehensive set of partial indicators. This early work relied on regression methods with an appropriate output measure as dependent variable and descriptors such as traffic throughput as explanatory variables. Measuring airport performance in multiple dimensions allows for systematic analyses of the distinguishing factors. Because of differences in the scope of services provided by sample airports, a 'standard set of activities' was identified and data was adjusted accordingly in an attempt of providing comparable measures. Major findings – especially of the latest study published in 1995 – were that for the European airports under scrutiny the importance of non-aeronautical income has increased and rental/concession revenues is growing with the share of international traffic. Labour costs still remain the largest single cost issue, although labour productivity is increasing in parallel to airport size. There is evidence of economies of scale, however ceasing beyond five million work load units (Doganis 1992; Doganis & Graham 1987; Doganis, Lobbenberg & Graham 1995; Doganis & Nuutinen 1983).

Tolofari, Ashford & Caves

Tolofari, Ashford & Caves attempted to estimate TFP for the BAA airports using parametric methods. This approach allows to investigate economies of scale and density and also to analyse performance variations due to input/output price changes. In fact, the study revealed that economies of size and density generally do exist and that factor demand was inelastic to price changes. The data requirements of such a parametric TFP approach, however, are very extensive (Tolofari, Ashford & Caves 1990).

Graham & Holvad

Graham and Holvad undertook an empirical DEA and free disposal hull analysis (FDH) application to examine the productive performance of European and Australian airports. In this context, the two major findings were that firstly the effect on the obtained efficiency measures by using DEA instead of FDH was explored. And secondly that DEA results corresponded well - but not perfectly well - to partial productivity measures. This suggests that the use of DEA in combination with PFP could be appropriate in order to get a comprehensive picture of the objects under scrutiny (Graham & Holvad 1997).

Hooper & Hensher

Hooper & Hensher pursued a non-parametric index number approach, estimating the multilateral index of TFP. The basic approach of this longitudinal study is a comparison of indices of outputs to indices of inputs. Besides criticising the disadvantages of PFP measures, they also stress the need to differentiate between the potential causes which might bring about variations in the overall productivity of individual airports. Although not the exclusive one, size in terms of the output level was clearly identified as a most significant determinant (Hooper & Hensher 1998).

Gillen & Lall

Gillen and Lall used DEA to construct performance indices on the basis of US airports‘ multiple inputs and outputs. They developed two DEA models based on landside and airside operations: The first one using the number of runways, gates, employees, baggage collection belts, parking lots and terminal area to explain total passengers and cargo handled; the second using airport area, number of runways, employees and runway area to explain air carrier and commuter movements. Whereas movements are assumed to be generated under constant scale returns, returns to scale are variable in the provision of

terminal services. The subsequent regression analysis revealed the impact of individual variables on performance and which of these – to a certain extent – are subject to management control.

Gillen and Lall state that DEA is an appropriate method to assess the performance of the management of transportation infrastructure. Especially its ability of handling multiple inputs and outputs is described as being a major advantage in comparison to traditional approaches. But several disadvantages have been identified as well: DEA imposes a-priori restrictions on production technology, it does not take factor prices into consideration and, finally, it is a non-statistical approach which does not allow for testing hypotheses (Gillen & Lall 1997).

Based on the study discussed above, Gillen & Lall constructed a Malmquist index of productivity change, decomposing it into scale effects, efficiency effects and technical change. In addition, they explored the relationship between airside and terminal efficiency and the tradeoffs between higher revenues and lower costs. Significant differences between airports and between the productivity growth of airsides and terminals were identified (Gillen & Lall 1998).

Sarkis

Sarkis analysed the operational efficiency of airports in the US for the period from 1990 to 1994. Unlike Gillen & Lall's studies no distinction was made between airside and landside services. In addition to the basic constant and variable returns to scale models a variety of other DEA models such as Simple Cross-Efficiency, Aggressive Cross-Efficiency, Ranked Efficiency and Radii of Classification Rankings were calculated. The application of various models allowed to assess the consistency of the results and provided complementary information. As with most other studies in the field, however, the focus

appears to have been on employing multiple models rather than producing reliable results (Nera 2001; Sarkis 2000).

Parker

Parker applied the DEA method to BAA airports' data before and after privatisation. The study focuses on the degree of change in technical efficiency following BAA's privatisation in 1987. Employment, capital stock, non-labour and capital costs were used as inputs and passenger numbers and cargo as well as mail tonnage as outputs. Technical efficiency was estimated with and without an input in order to reflect the business cycle or GDP. Including this variable resulted in increased efficiency during the recession years. It reduced, however, the discriminatory ability of the DEA model.

The study revealed that privatisation did not noticeably affect technical efficiency although later DMUs may be favoured over earlier ones, since technical efficiency can generally be expected to increase over time. The aggregate results of the BAA group hide significant differences in the individual operating division's technical efficiency and are therefore a composite of varying performance across the individual airports and over time. The study also confirmed the importance of scale factors in airport operations by a considerably higher number of relatively efficient DMUs under variable returns to scale (VRS) versus constant returns to scale (CRS) conditions (Parker 1999).

Pels, Nijkamp & Rietveld

The authors applied input-oriented DEA and stochastic production frontier analysis (SFA) to determine efficiency ratios for a sample of European airports. Similar to Gillen and Lall's split between terminal services and movements the authors estimate production frontiers for both passenger movements and air transport movements. According to their findings, most airports appear to operate under increasing returns to scale which is also

reflected in the most productive scale size (MPSS) where average productivity is maximized. SFA is a parametric method, measuring and explaining inefficiency simultaneously – as opposed to DEA. Whereas DEA assumes that the input set fully explains production and determines (in)efficiency using the distance to the frontier, SFA allows for an additional stochastic deviation or random error term. In principle, the stochastic frontier model reproduces the DEA results (Pels, Nijkamp and Rietveld 2001).

Martín & Román

Martín & Román's output-oriented variable returns to scale (VRS) DEA study is different from most other studies in so far as it applies cost data as inputs as opposed to merely physical inputs. The authors calculate the efficiency scores of 37 Spanish airports in 1997. The study establishes whether airports operate under increasing or decreasing returns to scale and indicates which efficient airports may be regarded as peers (Martín & Román 2001; Nera 2001).

Symonds Travers Morgan/Transport Research Laboratory

In 1997, the UK transport consultancy Symonds Travers Morgan (STM) started the publication of an annual report called 'Review of Airport Performance' which was taken over by the Transport Research Laboratory (TRL) since 1999 under the title 'Airport Performance Indicators'. Compiled under the responsibility of Peter Mackenzie-Williams, both comprise indicators of partial factor productivity for an increasing number of international airports. In addition to a wide variety of PFP indicators, techniques for measuring overall productivity are discussed briefly. Based on the respective data sets, single measures as produced by DEA are described and an alternative 'multi-attribute' approach was developed in cooperation with Durham University Business School. The latter one will be reviewed next.

It is a major characteristic of the STM/TRL reports that extensive adjustments were applied to the data in order to adjust for the different scope of services provided by sample airports. Similar to Doganis et al (1995), this is based on the definition of a theoretical 'standard airport' performing 'core tasks'. These adjustments were based on assumed profit margins of 'non-core activities' – different ones for different activities and different airports. Sensitivity analyses suggested that the results were to a certain extent sensitive to the margins assumed, especially regarding airports providing ground handling services (Nera 2001; STM 1997, 1998; TRL 1999, 2000, 2001, 2002).

Jessop

Based on the 1996/97 and 1997/98 STM/TRL sets of adjusted data, Jessop published two studies following a multi-attribute approach in comparison to DEA. The multi-attribute model is measuring overall performance as the weighted sum of constituent performance attributes. Since the six attributes themselves constitute a performance measure they are all ratios of some kind and thus in sharp contrast to DEA inputs. Still, results obtained from DEA and multi-attribute modelling were broadly similar. The form of results, however, was found to be a major difference. While DEA gave point estimates, the multi-attribute model – in which uncertainty about weight values is explicit – resulted in clusters of similarly performing airports. The two approaches are different both in their underlying concept and in the variables applied (Jessop 1999, 2000).

Air Transport Research Society (ATRS)

Another annual 'Airport Benchmarking Report' including indicators of partial and total factor productivity as well as several financial ratios is being published by the ATRS since 2002. Its airport benchmarking project team includes D. Gillen, T. Oum, B. Vasigh, C. Yu, P. Hooper, Y. Yoshida, K. Yoo, J. de Witt, E. Pels, K. Mason and N. Adler.

The ATRS report compares the performance of three aspects of airport operation: Productivity and efficiency, unit costs and financial results. A major difference to TRL's previously discussed 'Airport Performance Indicators' is that no adjustments are applied to the data of sample airports. The 2003 issue introduces a new measure of aggregate productivity termed variable factor productivity (VFP) in order to compensate for the deficiencies of PFP. The authors argue that in the short to medium term airports operate within the given state of their capital infrastructure and facilities. Therefore, VFP should only include non-capital or variable inputs. Because of the lack of data, however, it is then computed by aggregating labour productivity and soft cost input productivity weighted according to variable cost shares. 'Soft cost input' includes all expenses other than labour and capital, in order to accommodate different degrees of outsourcing.

Similar to the multi-attribute approach discussed above, TFP is calculated as a weighted average of partial factor productivities – in this case – variable factor productivity and capital input productivity. For both VFP and TFP additional residual indices are calculated, removing the effects of factors perceived to be beyond the airport operator's control (ATRS 2002, 2003).

#### 2.2.3.2 Conclusions

Although airport performance has become of interest to several stakeholders, collecting convincing operating and especially financial airport data is still a tedious exercise. Even nowadays many airports are very reluctant to communicate on their figures and quite a few appear to disguise data by incompatible definitions. And for the time being, there is also no accepted industry practice for measuring and benchmarking airport performance on various aspects of operational efficiency and productivity as well as financial performance. Most of the existing research in the area is on selected aspects of airport performance rather than providing a truly comprehensive picture.

It may also be stated that what all of the reviewed studies have in common is the fact that they are almost exclusively focusing on production analysis based on physical inputs rather than on financial performance – yet profitability is the investor's major concern. In many cases, sophisticated methodologies have been used, but the emphasis appears to have been on the application of the respective techniques rather than on the subject matter. From a managerial point of view, the vast majority of the studies reviewed are lacking practical relevance. Moreover, in almost completely neglecting the financing side and ignoring the impact of alternative capital structures on the financial performance of an airport business they do not cover an important aspect of reality.

The way in which some studies treat and/or adjust the collected data in order to cope with perceived comparability problems may actually create additional ones. In some cases, for example, missing data is simply replaced by similar input from a different reporting period. This, of course, is likely to result in an inaccurate assessment of the object of research.

Some studies and reports try to do away with the issue of different scopes of services by adjusting revenue, cost and staff numbers to arrive at a 'normalised set' and present the data as if all subjects undertook a similar set of activities. Any data adjustments of such a standardisation approach, however, will move the results away from reality, representing a 'standard' airport of theoretical nature only.

Any definition of and restriction to 'core tasks' also fails to take account of potential interdependence and/or complementarity of activities and excludes operational innovations as well as strategic diversification. Moreover, it is widely depending on the subjective judgement of the respective researcher, since there is neither an agreed standard nor an objective common measure for the application of data adjustments.

Although this approach has its merits with regard to partial performance measures for a specific point in time, it does not necessarily reveal all areas for further improvements

– as compared to best practice – to a prospective private or strategic or institutional investor. Nor does it give a true and fair picture of the earning power as a basis for evaluation.

In almost exclusively focusing on partial indicators of productive efficiency this approach is neglecting the financial performance and the consideration of the financing side of the airport business. For consistency's sake, it would actually make a complete restatement of both the assets and the liabilities side of the balance sheet mandatory as well, in order to reflect any adjustments on the operating level. Ground handling services. for example, is not only labour intensive but in addition requires substantial investment in assets such as vehicles and special equipment.

But it is the actually existing airport company rather than a conceptually normalised one which is of interest to the investor, the real business as it stands and is listed at the stock exchange or offered in a trade sale. Therefore, raw data will be applied in this long-term comparison as opposed to other research in the field which is more or less exclusively focusing on PFP, to properly assess the subjects' performance as reflected in their financial statements.

Therefore, no attempt will be made in the present study to artificially create a theoretical 'standard' airport, since there is no such thing. This 'gross approach' is to avoid any distortion of the true circumstances – seen from the investor's angle who is primarily interested in his return based on the underlying profitability – and hence seems to be the most appropriate in this context. The majority of recent studies in the field which are not explicitly focusing on PFP are pursuing this approach as well.

## 2.3 Summary

Privatisation policies have increasingly been in progress all over the world and across industries for a considerable period of time. The motives are diverse but usually

include the objective of enhancing operating efficiency and financial performance and – to a minor extent – increasing consumer responsiveness.

Regarding the privatisation of its airports, Europe is moving towards changing the ownership structure at individual phases in an evolution from state-owned and operated utilities to fully commercial private enterprises. This is stimulating the demand for benchmarking airport performance.

Several powerful analytical tools of performance measurement have been described. Performance is a relative concept. Methods of measuring efficiency and performance may be applied to private sector firms as well as to non-profit organisations. Some of them will be applied in the course of this study to assess the medium- and long-term performance of the objects under scrutiny.

Financial ratio analysis involves assessing a company's profit and loss statement and balance sheet data. It has been introduced as an interrelated system of performance indicators describing the operational and financial status at a certain point in time. The Du Pont chart describes the relationships between the return on assets generated by the business, asset turnover, the profit margin and financial leverage. Trend analysis can provide a dynamic view of the respective development over time. Ratio analysis is a commonly used technique for analysing the financial performance and underlying causal relationships of a firm. Ratios standardize numbers and facilitate comparisons. Therefore, ratio analysis is frequently employed for benchmarking companies, also across industry sectors. Still, it has not yet been extensively applied to airports.

PFP measures give only partial information, relating specifically to the chosen determinants instead of representing a complete picture of performance, which leaves the problem of interpreting a whole set of indicators.

TFP approaches are appropriate for measuring the productive performance of an airport over time and also for cross-sectional benchmarking. The three outlined

approaches, parametric TFP, non-parametric TFP and DEA, quantify a single unitless index of overall efficiency and basically reveal the same results.

Multi-attribute assessment is based on the concept of partial factor productivity but comes up with an easy to handle single unitless measure like TFP/DEA. This is essentially summarizing selected PFP indices which are weighted according to an unstandardized preference scheme or according to weights derived from statistical analysis and then merged into one overall score.

While single measures come in handy for rankings in a benchmarking exercise they tend to disguise the background. The analytical power of partial factor and ratio analysis, however, appears not only to state results but also to explore the roots and critical success factors of performance – at the expense of a variety of indicators and ratios which need to be interpreted. And considered in isolation, partial productivity measures may even provide a misleading indication of overall productivity. Table 2.4 summarizes the major advantages and disadvantages of the above-described performance measurement techniques.

Table 2.4: Strengths and Weaknesses of Techniques Measuring Productive Efficiency and Financial Performance

| **Method** | **Focus** | **Advantages** | **Disadvantages** |
|---|---|---|---|
| Financial Ratio Analysis | • financial performance/ efficiency<br>• investors' focus: profitability | relatively easy to develop from financial statements, fundamentally reliable | based on statements under specific accounting and taxation regulations |
| Partial Factor Productivity | • productivity/efficiency<br>• factor input/output | allows monitoring of specific areas/activities for improvement | considers only subsets; does not account for factor substitution/prices |
| Total Factor Productivity | • productivity/efficiency<br>• factor input/output | indicates overall efficiency; allows for economies of scale and scope effects | does not consider service effectiveness |
| Data Envelopment Analysis | • productivity/efficiency<br>• factor input/output | indicates overall efficiency; flexible treatment of input and output weights, allows for economies of scale; less demanding data requirements | possibly limited discriminatory ability; does not allow hypothesis testing |
| Multi-Attribute Analysis | • productivity/efficiency<br>• factor input/output | indicates overall efficiency; based on PFP concept | involves expression of preference and codification of tradeoffs |

Airports utilize multiple inputs in generating multiple outputs and the required methodology for measuring total productive performance over time and cross-sectional benchmarking needs to derive a single efficiency measure encompassing all inputs and outputs as provided by DEA. DEA is not involving the estimation of an underlying production or cost functions and data analysis is based on the assumption that airport companies deliberately decide on their individual factor input. All airports use similar inputs to produce the same outputs and hence may be regarded homogeneous decision-making units. Although there are some disadvantages to DEA measures, it is commonly regarded as an appropriate approach for airports and will be applied in parallel to the more conventional tools like the analysis of partial factor productivity, financial ratios, and share prices with regard to the quoted airport companies.

It needs to be recalled that none of the above-mentioned studies has actually addressed the question whether or not there is any relationship between the privatisation of commercial airports and their financial performance. Amongst the reviewed research it is only Parker who investigated the performance of BAA before and after its privatisation as a sole subject, whereas a general benchmarking against a peer group of publicly owned versus partially or fully privatised airports has not been conducted. Moreover, none of those studies ever applied a multitude of methods and tools simultaneously in order to measure and benchmark airport efficiency and productivity from different angles. Only a few paralleled an analysis of partial and total factor productivity.

Previous studies were almost exclusively focusing on efficiency and productivity analysis rather than financial performance. Although partial factor productivity indicators usually include a limited number of financial ratios, neither an extensive in-depth financial ratio analysis has been carried out, nor have questions of capital structure and the financing of assets been involved.

Especially more recent studies have used increasingly more sophisticated methodologies, but primary attention appears to have been on the application of various research tools rather than on the subject matter. From a managerial position, the majority of the studies reviewed are lacking real practical relevance. From a scientific standpoint, several of them are based on an unduly simplified model of reality, because of the collection and/or treatment of data. From the investor's perspective, most are not qualified for decision-making, since they do not reveal a correct indication of profitability.

As stated in Chapter 1, the present study will primarily focus on financial performance of sample airports. Ultimately, it is aiming at investigating differences which may be attributable to ownership patterns. All data analysis procedures will be supported by the Statistical Package for the Social Sciences (SPSS®) Graduate Pack and the Data Envelopment Analysis (DEA-Solver, © 2000, Kluwer Academic Publishers) Software Package for Windows®.

# CHAPTER 3

# STATEMENT OF HYPOTHESES AND RESEARCH QUESTION

## 3.1 Statement of Hypotheses

The major European commercial airports are evolving from mere air transport infrastructure providers into multifaceted commercial operations and intercultural meeting points. They become attractive marketplaces, comprising hotels, conference centres, shopping malls and duty-free shops, car parking and rental activities. In addition, they provide a wide range of facilities and services for airlines, tenants, concessionaires, meeters and greeters, state authorities and all kinds of businesses and service providers, including employees (Feldman, D., 1996; Freathy & O'Connell 1998; Kapur 1996).

The tremendous flow of passengers and cargo alongside the increase in international trade makes airports the hub of a multimodal transport network, serving as the host of a myriad of economic activities. But the continuing growth has also revealed capacity gaps that affect all airport constituencies. Closing these gaps demands a sector policy framework, plus suitable harmonisation of local, national and international regulatory frameworks, improved management and, most of all, private sector capital (Gangl 1999; Kapur 1996).

Since privatisation can only be a successful strategy for this new millennium if private sector capital can be attracted to the market, the hypotheses to be tested in this study can be formulated as follows:

i. Partially or fully privatised European commercial airports operate more efficiently than others.

ii. Partially or fully privatised European commercial airports are an attractive investment as compared to alternative capital projects.

## 3.2 Definition of Ownership Structure

A simple view of privatisation is the change of ownership of the property and facilities and specifically the transfer from a government agency to private investors. This is misleading regarding airports, since most privatisations of major commercial airports did not involve the actual sale of the property, the privatisation of the former British Airports Authority being the most notable exception. Airport privatisation usually involves only the transfer of *some* ownership rights (Advani 1998; De Neufville & Odoni 2003).

Due to the above, in this context 'privatised' is defined as a long-term private risk investment in terms of an equity stake (in excess of 75% to qualify as fully privatised), a long-term lease or concession agreement, or a 'build, operate and transfer' (BOT) franchise, as distinct from shorter-term management contracts without equity commitment. Where partial privatisation is found, this is defined as a minimum private share of more than 20% or an adequate lease/concession agreement with regard to total equity. Since without a substantial economic involvement and corresponding risk, investors will hardly be able to exercise effective management control eventually improving operational efficiency and financial performance in order to achieve a reasonable return. Table 3.1 summarizes the definitions as applied in this study.

Table 3.1: Definitions of Ownership Structure

| **Ownership Status** | **Definition** |
|---|---|
| Public Ownership | No involvement of private parties. |
| Partially Privatised<br>(PPP = Public Private Partnerships) | Requires a minimum private share ≥ 20% with regard to total equity or a lease or concession agreement with a similar risk profile. |
| Fully Privatised | Long-term private risk investment in terms of a substantial equity stake ≥ 75%, long-term lease or concession agreement, or a BOT franchise. |

Due to its pseudo-partial privatisation under the Eurohub Ltd. BOT-scheme, Birmingham, for example, is considered partially privatised for the full period. Liverpool is

accounted for as fully privatised for the entire period in accordance with the aforementioned definition, although the private sector share was increased to 100% not before 2001 from previously 76%.

### 3.3 Statement of Research Question

The complementary research question is which critical key success factors distinguish financially successful airports from others.

Comprehensive long-term financial research will be conducted in order to explore and assess the hypotheses in quantitative terms. Beyond the primary issue, how private versus public ownership affects performance, discretionary aspects will address the research question for distinctive features.

The aim of this investigation is to clarify, whether commercial airports can be run as profitable enterprises and if so, which new approach of the airport business may be required to be successful. Another issue of importance is to which extent the higher returns demanded by the private sector are reinvested into the companies, as it may be an obligation under the respective privatisation agreements

The ratios, percentages and other relationships that will be described for the sample airports may isolate areas requiring further investigation. In order to take full advantage of these findings, they have to be assessed and interpreted with due consideration of the above-stated background information on the aviation industry and the state of the airport sector on a global scale, as well as general economic conditions and trade cycles as the most important parameter of air traffic development.

# CHAPTER 4

# RESEARCH METHODOLOGY

The research on partial factor productivity will build on previous work undertaken at both the University of Westminster and Cranfield University, UK, while financial ratio and share price analyses are to a certain extent based on the candidate's Masters thesis, carried out at Embry-Riddle Aeronautical University, Fl., USA. The application of data envelopment analysis to airport financial data as well as the application of several statistical procedures in the course of the extended data analysis to financial data of publicly owned versus partially and fully privatised airports are genuinely unique, resulting in an independent and original contribution to the body of knowledge.

## 4.1 Main Focus and Methodology

### 4.1.1 Scope of this Study

This study will focus on the economic performance of European commercial airports in public, mixed public-private and fully private ownership. The financial aspects and results of partial or full privatisation will be assessed from the investor's point of view. Based on these findings, the valuation of an airport business and the development of an airport business model describing the relationships between the financial performance and the nature of airports are treated and the key success factors will be identified.

Since financial results are reflecting a company's achievements over a diverse array of activities, they are arguably by far the most important dimension of performance. Legal, social and other aspects of airport privatisation will not be considered. Aspects of airport service quality will also not be explicitly considered. Geographically, the scope has been restricted to Europe, since all sample airports enjoy similar market as well as operational conditions and are subject to the same kind of overall economic and traffic development.

The period under consideration is the decade from 1990 to 1999 or Quarter I, 2000. respectively, where the reporting period is for the fiscal year ending 31 March. This longitudinal study presupposes continuity within a comparatively stable framework in order to properly identify differences eventually caused by the ownership structure of sample airports rather than by external alterations like the abolition of intra-EU duty-free sales or the massive market penetration of low-cost carriers and its consequences for airport operations and pricing. Moreover, subsequent financial sample data increasingly includes capital investments in foreign participations. Not to mention the economic downturn beginning in 2000 and its impact on derived air transport, nor the following unprecedented crisis of the entire aviation industry due to the terrorist attacks on September 11, 2001, the war on Iraq and the outbreak of the SARS virus in early 2003.

### 4.1.2 Subjects and Instruments

Historical research will be applied which involves studying, understanding and explaining past events. The purpose of this approach is to arrive at conclusions concerning causes, effects, or trends of past occurrences that may help to explain present problems, answer crucial topical questions and anticipate future developments in the European airport sector. Empirical data, financial as well as operational, will constitute the core of the quantitative research analysis. Basic data supporting the research findings will be attached in the various appendices.

The sample of European airports represents a cross-section, from Europe's leading London Heathrow to smaller ones like Basel and Cardiff. It includes privately owned airports, like Glasgow, partially privatised airports, such as Dusseldorf, publicly quoted companies, like Copenhagen and Vienna, and publicly owned but organisationally independent airports, such as Cologne and Geneva.

Table 4.1: Total Sample of European Airports (Ownership Structure as of 1999)

| Code | Publicly Owned Airports | TAM 1999 | Total ('000) PAX 1999 | Total (tn) Air Cargo 1999 |
|---|---|---|---|---|
| **ADP** | **Aerop. de Paris, France** (CDG, ORY, others) | 1,710,664 | 69,016 | 1,361,039 |
| AMS | Amsterdam, Netherlands (AMS, RTM, others) | 688,095 | 37,740 | 1,227,106 |
| **BER** | **Berlin Group, Germany** (SXF, THF, TXL) | 217,643 | 12,379 | 41.653 |
| BSL | Basel Mulhouse, Switzerland/France | 124,956 | 3,572 | 72,932 |
| CGN | Cologne, Germany | 151,335 | 6,089 | 410,436 |
| FRA | Frankfurt, Germany | 439,093 | 45,839 | 1,538,822 |
| GVA | Geneva, Switzerland | 159,256 | 6,995 | 51,320 |
| HAM | Hamburg, Germany | 156,525 | 9,459 | 52,423 |
| LBA | Leeds/Bradford, UK | 63,954 | 1,463 | 236 |
| MAN | Manchester, UK | 185,041 | 17,760 | 112,229 |
| MRS | Marseille, France | 123,131 | 6,017 | 58,584 |
| NCL | Newcastle, UK | 79,289 | 3,022 | 4,239 |
| **RIA** | **AerRianta, Ireland** (DUB, ORK, SNN) | 264,948 | 16,488 | 158,561 |
| ZRH | Zurich, Switzerland | 306,182 | 20,925 | 378,449 |
| **Code** | **Partially Privatised Airports** | **TAM 1999** | **Total ('000) PAX 1999** | **Total (tn) Air Cargo 1999** |
| ADR | Aeroporti di Roma, Italy (CIA, FCO) | 285,696 | 24,683 | 199,769 |
| BHX | Birmingham (International), UK | 118,368 | 7,027 | 30,304 |
| BRS | Bristol, UK | 61,723 | 2,016 | 8,265 |
| CPH | Copenhagen, Denmark (CPH, Roskilde) | 394,747 | 17,502 | 315,348 |
| DUS | Dusseldorf, Germany | 194,065 | 15,926 | 61,541 |
| HAJ | Hanover, Germany | 94,711 | 5,085 | 14,671 |
| NAP | Naples, Italy | 56,895 | 3,660 | 4,956 |
| VIE | Vienna, Austria | 191,742 | 11,204 | 125,585 |
| **Code** | **Fully Privatised Airports** | **TAM 1999** | **Total ('000) PAX 1999** | **Total (tn) Air Cargo 1999** |
| ABZ | Aberdeen, UK | 103,985 | 2,470 | 5,933 |
| **BAA** | **BAA Group, UK** | 1,229,900 | 117,423 | 1,929,844 |
| BFS | Belfast, UK | 101,453 | 3,038 | 40,461 |
| BRU | Brussels, Belgium | 313,929 | 20,005 | 656,302 |
| CWL | Cardiff, UK | 65,293 | 1,334 | 2,854 |
| EDI | Edinburgh, UK | 101,192 | 5,114 | 48,176 |
| EMA | East Midlands, UK | 72,712 | 2,231 | 142,345 |
| GLA | Glasgow, UK | 101,339 | 6,810 | 12,026 |
| LGW | London Gatwick, UK | 255,569 | 30,559 | 313,627 |
| LHR | London Heathrow, UK | 458,270 | 62,263 | 1,355,417 |
| LPL | Liverpool, UK | 76,194 | 1,308 | 42,178 |
| LTN | Luton (London), UK | 79,793 | 5,273 | 27,433 |
| STN | Stansted (London), UK | 155,080 | 9,453 | 193,986 |

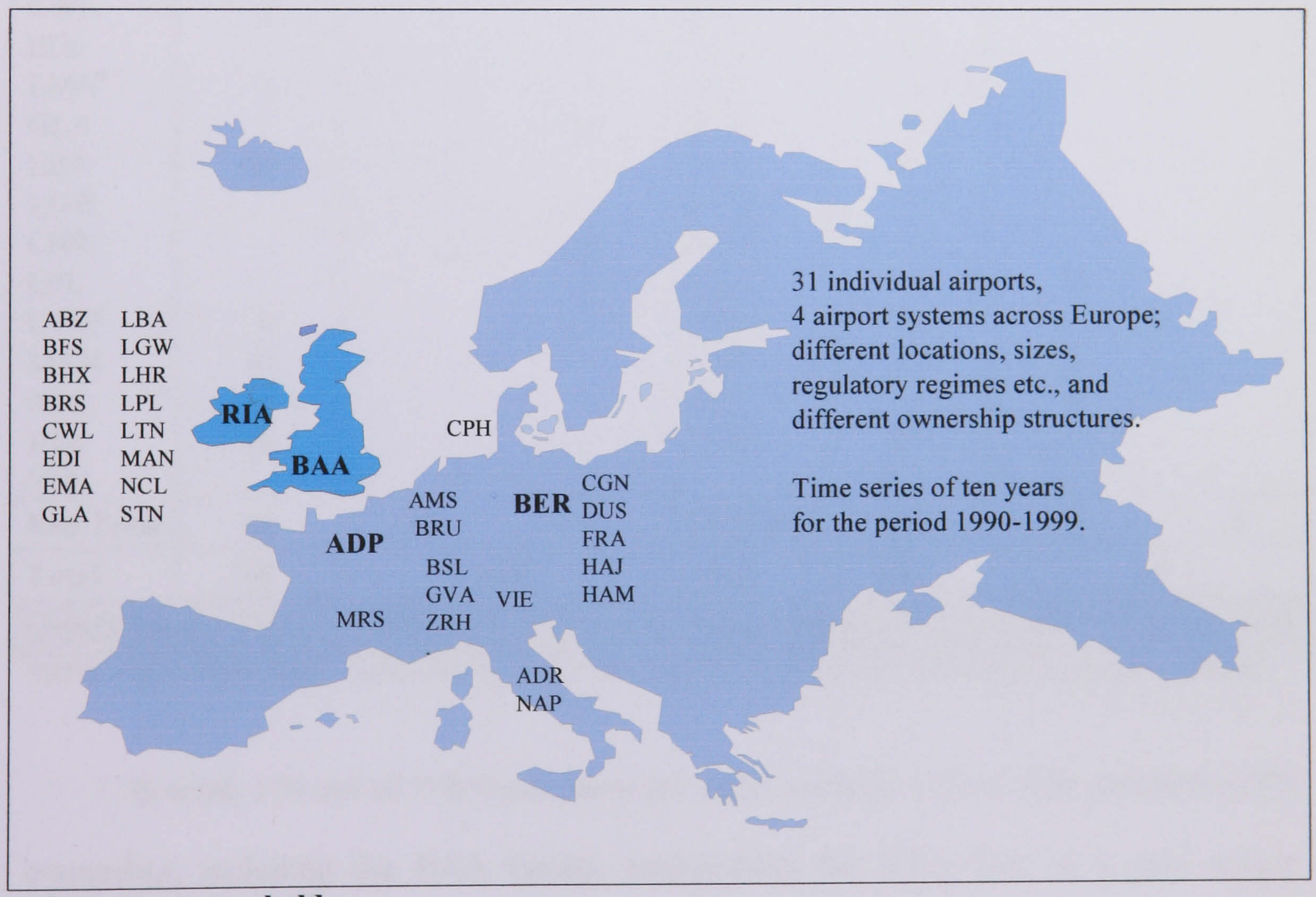
Airport systems = **bold** Source: ACI 2000c, d, e; Company data

Note: Figures are totals for the calendar year 1999; Total aircraft movements (TAM) = air transport movements (ATM) + other movements; Total PAX = terminal passengers + transit passengers

Principal sources of data are the respective reports and accounts and the statistical series on 'The UK Airports Industry', published by the Centre for the Study of Regulated Industries/Chartered Institute of Public Finance and Accountancy (CRI/CIPFA). Where required, additional financial data from the Companies House, London, was supportive for clarifications. Additional traffic statistics were obtained from ACI, various 'UK Airports – Annual Statements of Movements, Passengers and Cargo', published by the CAA, and the German Airports Association (ADV). General information on the sample airports was collected directly from the respective airports and various industry journals.

The sample airports are almost evenly distributed over the British Isles and Mainland Europe as illustrated by Figure 4.1.

Figure 4.1: Geographical Distribution of Sample Airports




Airport systems = **bold**

Ownership status or structure is another characteristic of major importance in the context of this study. As per the definition stated in Chapter 3, publicly owned, partially privatised and fully privatised airports are being considered.

Table 4.2 below displays the ownership structure of sample airports in terms of fiscal years under public, fully private, or mixed ownership. Due to the fact that the UK historically paved the way for airport privatisation based on the Airports Act as of 1986, the number of partially and fully privatised airports is significantly higher in the British Isles than in Mainland Europe (Caves & Gosling 1999; Humphreys 1999).

Table 4.2: Number of Fiscal Years in Public, Mixed Public-Private or Fully Privatised Ownership 1990-1999

| **British Isles** | | | | **Mainland Europe** | | | |
|---|---|---|---|---|---|---|---|
| **Airport / Group** | **Publicly Owned** | **Privatised** | | **Airport / Group** | **Publicly Owned** | **Privatised** | |
| | | **Partially** | **Fully** | | | **Partially** | **Fully** |
| ABZ | | | 10 | ADR | 7 | 3 | |
| **BAA** | | | **10** | **ADP** | **10** | | |
| BFS | 4 | | 6 | AMS | 10 | | |
| BHX | | 10 | | **BER*** | **6** | | |
| BRS | 8 | 2 | | BRU* | | | 8 |
| CWL | 5 | | 5 | BSL | 10 | | |
| EDI | | | 10 | CGN | 10 | | |
| EMA | 3 | | 7 | CPH | 4 | 6 | |
| GLA | | | 10 | DUS* | 6 | | |
| LBA | 10 | | | FRA | 10 | | |
| LGW | | | 10 | GVA | 10 | | |
| LHR | | | 10 | HAM | 10 | | |
| LPL | | | 10 | HAJ | 8 | 2 | |
| LTN* | 8 | | | MRS | 10 | | |
| MAN | 10 | | | NAP | 7 | 3 | |
| NCL | 10 | | | VIE | 2 | 8 | |
| **RIA** | **10** | | | ZRH | 10 | | |
| STN | | | 10 | | | | |
| **Sub Total** | **68** | **12** | **98** | **Sub Total** | **130** | **22** | **8** |
| **Total** | **68** | **110** | | **Total** | **130** | **30** | |
| **Grand Total** | | **178** | | **Grand Total** | | **160** | |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 90/91-97/98; Airport systems = **bold**

In total, 110 out of 178 fiscal years are under partially (12) or fully privatised (98) ownership, including the BAA Group, emphasising the UK's role as a pace maker regarding airport privatisation. Across Mainland Europe, 30 (22 partially and 8 fully privatised) out of 160 are counted. Further details of individual sample airports are compiled in Appendix B.1, Airport Specifics.

It needs to be noted that BER, BRU, DUS and LTN are not included for the full period. The Berlin Brandenburg Airports Holding was only established after the German reunification by the merger of Tegel (TXL), Tempelhof (THF) and Schoenefeld (SXF) airports. Since financial group data especially for the years 1992 and 1993 is biased by merger effects and thus not comparable, BER is included for 1994-1999 only.

Because of data inconsistencies brought about by material changes of circumstances, BRU, DUS and LTN do not lend themselves to an analysis of financial performance before and after a change in ownership. BRU data is only applied for the period of 1990-1997, in order to avoid inconsistencies caused by the merger of the former terminal operator Brussels Airport Terminal Company (BATC) in private ownership and the airport activity branch of the Belgian Airport and Airways Agency (BAAA). In 1998, they formed Brussels International Airport Company (BIAC) in mixed public-private ownership. Due to the enlarged scope of activities – airside and landside – subsequent data is not comparable. DUS is included for the years 1990 up to and including 1995 before the fire accident in 1996. Subsequent data is dominated by knock-on effects and therefore not representative. Moreover, it is not possible to distinguish between after-effects of the fire catastrophe including i.e. insurance proceeds and reconstruction of a terminal building on the one hand and effects of partial privatisation effective as of 1998 on the other. LTN, London Luton Airport Ltd. (LLAL), is included for the period 1990/91-1997/98 before full privatisation based on a long-term concession granted to a third party constituting a separate legal entity. Although the scope of operations remained basically unchanged for the concessionaire London Luton Airport Operations Ltd. (LLAO), balance sheet data of the operating company is not comparable. The same applies to the profit and loss account, if it is only for the substantial concession fee due to the owner Luton Borough Council.

### 4.1.3 Research Design and Procedures

This research is a comparative study of historical operational and – primarily – financial data. Based on the concept of performance indicators describing input-output relationships and the approach of applying PFP measures to airports, the comparisons are made by working out the indicators and/or ratios for the individual sample airports as well as several sub groupings. For the reasons explained above, the period under consideration is 1990 to 1999 inclusive.

Descriptive measures constitute the context for these indicators, with 'ownership structure' as the decisive feature. The indicators include measures of aggregate and disaggregate costs and revenue, labour and capital productivity, revenue generation and commercial performance and ultimately profitability. One contribution to the knowledge of the subject will be the application of the concept of performance indicators prior to and after partial or full privatisation of the respective airport companies over a ten years period.

Emphasis will then be placed on the aggregate measures which consider the entire airport company. Although they are of limited use to airport management, these ratios provide sound indications of an airports' relative performance. And this is exactly what the investor is looking for.

Partial factor productivity measures the ratio of one or more inputs to one or more outputs, giving only partial indication relating specifically to the chosen determinants. The disadvantage is that they do not give a complete picture of performance, leaving the problem of interpreting a whole set of indicators. They also do not take account of factor substitution effects. These shortcomings suggest alternative total measures referring to the relationship of the combined factor inputs with the combined output produced.

Therefore, the concept of total factor productivity shall be applied to the study airports. This aims at complementing the PFP results by additionally allowing for the possibility of economies of scale and scope. TFP techniques and especially DEA have

already been successfully utilized in the air transport industry and applied to airports in particular. The present data envelopment analysis, however, will be based on strictly financial variables as opposed to previous DEA work which has almost exclusively been based on physical measures. Such a DEA time series of airports, investigating significant alterations also in the course of changes in ownership structure is intended as another genuine contribution of this study to the body of research on the subject.

Alongside these statistical procedures, a conventional analysis of the standard financial statements and the share price development for the publicly quoted companies will be undertaken. This includes analyses of cost and revenue structures, return rates and relative share price performance for airports which are listed at a stock exchange.

The analysis of more than 300 observations per constituent of any indicator or ratio for the total sample will result in a comprehensive survey on the financial performance of the subjects under scrutiny. Measurement methods of these key variables are in principle identical to those of previous research on the topic, although they have never been applied as extensively and even simultaneously to arrive at a holistic picture of the industry. Moreover, none of the researched studies has actually addressed the question whether there is a relation between the privatisation of commercial airports and their financial performance or conducted a benchmarking of publicly owned versus partially or fully privatised airports. Although partial factor productivity indicators usually include some financial ratios, neither an extensive and in-depth financial ratio analysis has been carried out, nor have questions of capital structure and the financing of assets been involved.

In addition, this longitudinal study is designed to permit observations over an extended period of ten years. It is the objective of such a trend study to identify changes in the economic performance within the sample population of European airports over time. The panel of nine airport companies experiencing a change in ownership during the period under consideration will be assessed prior to and after partial or full privatisation.

## 4.2 Data Collection and Analysis

### 4.2.1 European Economic and Traffic Development in the 1990s

In the beginning of the decade under consideration in this study, the Gulf War and the following economic recession resulted in a real decline in air travel. The ever-increasing globalisation and internationalisation of tourism in parallel to EC deregulation and liberalisation of civil aviation, however, finally resulted in a remarkable continuing growth of European air traffic (Button et al 1998; Pfähler, Niemeier & Mayer 1999)

Despite political destabilisations like the collapse of the former Eastern Block in the late 1980s and the Gulf War in 1991, the '90s were a decade of growth. Initially, the 1991 recession seriously affected air traffic, which recovered again in 1992. The stimulating effect on traffic demand primarily resulted from reduced fares. Economic growth started picking up again in 1993/94 and additional services and frequencies were introduced as a result of continuing liberalisation (Airbus 1999; Boeing 2000, 2001; Burghouwt & Hakfoort 2001).

The actual physical growth which materialized at the sample airports has to be judged against the background described above and the overall growth in passengers of approximately 60% counted at European airports based on ACI data over this decade. This figure is taking into consideration that most Eastern European airports did not participate in the collection of statistical data in the base year 1990 but were only involved subsequently.

Regarding monetary growth, additional external economic factors such as price inflation and currency fluctuations have to be taken into consideration as displayed in Table 4.3. It renders the overall individual growth of terminal passengers and relates this to the European average growth. The overall real increase in total revenue (inflation-adjusted in prices of 1995) in local currency and in Euro/ECUs is setting against alternative real growth rates resulting from exchange rate fluctuations. The growth of WLUs is a measure

of total traffic growth including mail and freight. The last column relates the total increase in revenue (real, in Euro/ECUs) of each airport to the individual total growth of WLUs.

Table 4.3: Overall Physical and Monetary Growth Rates 1990-1999

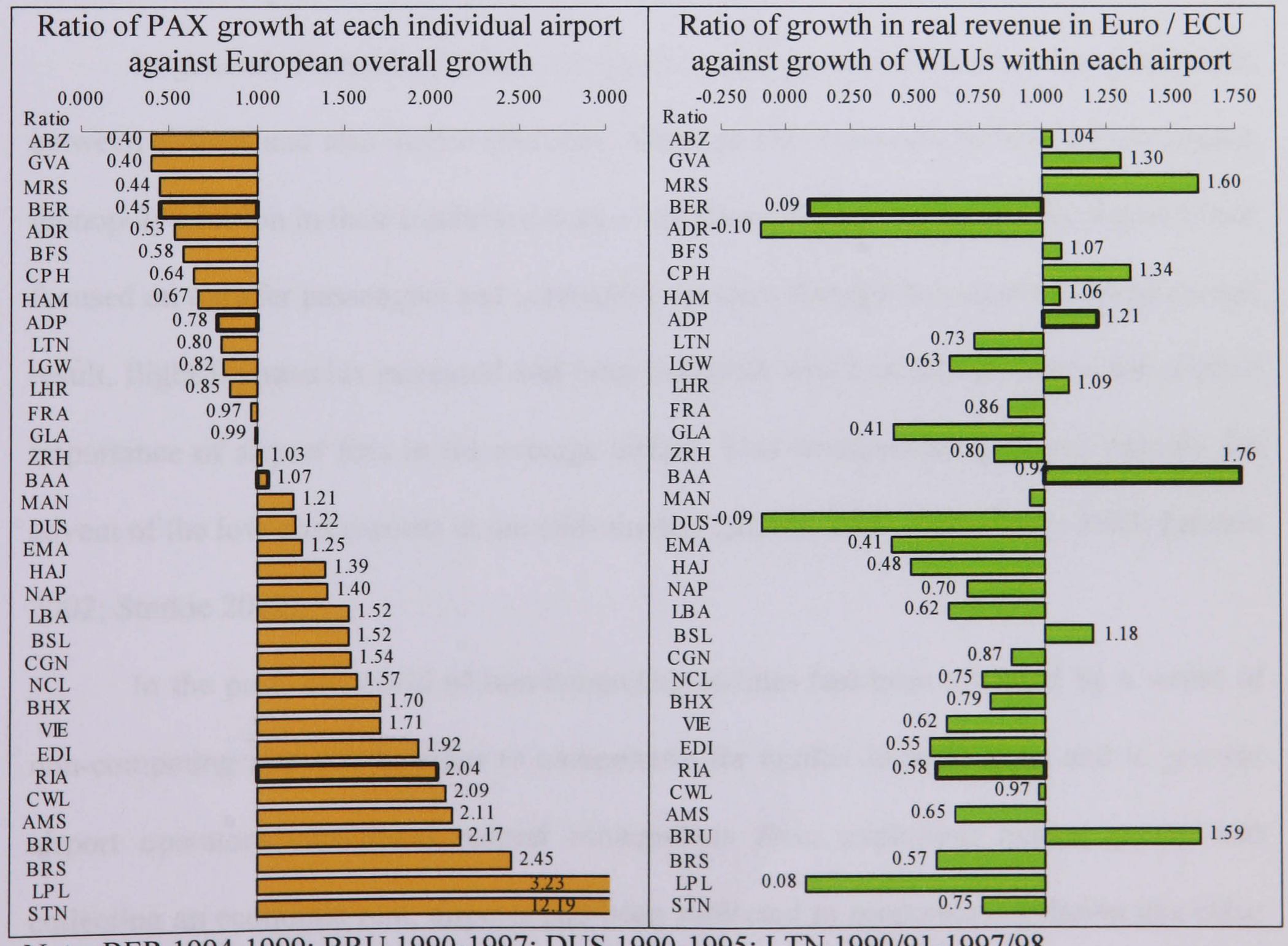
| Airport/ Group | Terminal Passenger Growth | | Air Cargo Growth per Individual Airport | Total Revenue Growth (indexed to 1995) | | WLU Growth per Individual Airport | Individual Revenue Growth vs. WLU Growth (ratio) |
|---|---|---|---|---|---|---|---|
| | per Individual Airport | Individual Growth vs. European Growth (ratio) | | per Individual Airport in Local Currency | per Individual Airport in Euro / ECU | | |
| ABZ | 23.9% | .398 | -25.9% | 11.6% | 22.8% | 22.0% | 1.036 |
| **ADP** | **46.7%** | **.778** | **45.5%** | **47.5%** | **56.2%** | **46.5%** | **1.209** |
| ADR | 32.0% | .533 | -31.4% | 23.6% | -2.3% | 23.3% | -.099 |
| AMS | 126.7% | 2.112 | 93.8% | 66.7% | 76.1% | 117.5% | .648 |
| **BAA** | **64.1%** | **1.068** | **81.7%** | **96.8%** | **116.6%** | **66.4%** | **1.756** |
| **BER*** | **21.6%** | **.448** | **-6.5%** | **4.4%** | **1.8%** | **20.4%** | **.088** |
| BFS | 34.8% | .580 | 32.8% | 24.5% | 36.9% | 34.6% | 1.066 |
| BHX | 102.2% | 1.703 | 9.4% | 60.0% | 76.1% | 96.3% | .790 |
| BRS | 147.1% | 2.452 | 173.8% | 67.9% | 84.7% | 148.1% | .572 |
| BRU* | 90.6% | 2.167 | 63.3% | 122.6% | 132.2% | 82.9% | 1.595 |
| BSL | 91.2% | 1.520 | 151.9% | 105.4% | 117.5% | 99.5% | 1.181 |
| CGN | 92.4% | 1.540 | 128.2% | 81.5% | 91.7% | 105.5% | .869 |
| CPH | 38.6% | .643 | 77.3% | 48.3% | 58.1% | 43.4% | 1.339 |
| CWL | 125.1% | 2.085 | -12.7% | 94.6% | 114.1% | 117.2% | .974 |
| DUS* | 29.7% | 1.217 | 21.1% | -11.1% | -2.7% | 29.3% | -.092 |
| EDI | 115.3% | 1.922 | 232.6% | 52.1% | 67.4% | 122.0% | .552 |
| EMA | 75.2% | 1.253 | 583.8% | 49.1% | 59.8% | 147.0% | .407 |
| FRA | 58.2% | .970 | 22.2% | 32.9% | 40.4% | 47.2% | .856 |
| GLA | 59.6% | .993 | -53.1% | 10.7% | 21.8% | 53.1% | .411 |
| GVA | 24.1% | .402 | -22.1% | 16.6% | 25.0% | 19.2% | 1.302 |
| HAJ | 83.3% | 1.388 | -33.4% | 28.5% | 35.7% | 74.6% | .479 |
| HAM | 40.1% | .668 | -9.6% | 31.1% | 38.5% | 36.2% | 1.064 |
| LBA | 91.1% | 1.518 | -56.5% | 41.8% | 56.0% | 90.0% | .622 |
| LGW | 48.9% | .815 | 42.0% | 18.5% | 30.3% | 48.2% | .629 |
| LHR | 50.9% | .848 | 84.2% | 46.5% | 61.2% | 56.1% | 1.091 |
| LPL | 193.8% | 3.230 | 59.9% | 0.6% | 11.2% | 148.4% | .075 |
| LTN* | 33.6% | .804 | -24.1% | 14.6% | 19.6% | 27.0% | .726 |
| MAN | 72.8% | 1.213 | 45.4% | 51.6% | 66.9% | 70.9% | .944 |
| MRS | 26.5% | .442 | 19.5% | 33.5% | 41.4% | 25.8% | 1.605 |
| NAP | 84.0% | 1.400 | -4.2% | 98.6% | 56.9% | 81.7% | .696 |
| NCL | 94.0% | 1.567 | 24.3% | 53.9% | 69.4% | 92.5% | .750 |
| **RIA** | **122.1%** | **2.035** | **119.0%** | **74.1%** | **70.3%** | **121.9%** | **.577** |
| STN | 731.2% | 12.187 | 448.2% | 448.1% | 503.1% | 669.5% | .751 |
| VIE | 102.3% | 1.705 | 94.5% | 53.9% | 62.6% | 101.5% | .617 |
| ZRH | 62.0% | 1.033 | 39.6% | 36.6% | 46.4% | 58.1% | .799 |
| **Unweighted Sample Average** | | | | | | | |
| | **93.3%** | **1.605** | **68.6%** | **57.1%** | **66.1%** | **90.5%** | **.768** |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 90/91-97/98; Airport systems = **bold**
The BAA Group is excluded from average to avoid double counting.

A comparison of these descriptive statistics reveals a considerable spread of overall individual passenger growth across sample airports averaging around 93% or a ratio of 1.6 as compared to the overall European growth in airport passengers of approximately 60%, over this decade based on ACI data. Some are clearly below this benchmark, several around par, while others are fairly above, with STN being the frontrunner. The same, in principle, holds true for the overall growth of WLUs as a measure of the total physical output including air cargo, indicating a differentiation in the activities of sample airports.

The increase in physical output almost always outnumbers the real increase in total revenue denominated in local currency. The picture is slightly diverse in comparison to the revenue growth expressed in Euro/ECUs, due to foreign exchange rate fluctuations. Adjusted for inflation, a substantial number of sample airports' revenue growth is lagging considerably behind their own physical traffic growth as illustrated by Figure 4.2.

Figure 4.2: Relative Growth of Terminal Passengers and Total Revenue 1990-1999




Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
Airport systems = **bold**

There exists a considerable spread across the sample in terms of overall individual growth in revenue relative to the overall individual growth of physical output (WLUs). Besides macroeconomic changes, physical growth may also be affected by network development and aspects of competition, while the prevailing regulatory regimes may have an additional impact on monetary growth.

The analysis of the evolution of an increasingly deregulated European aviation network during the period under consideration reveals that a hub-and-spoke structure had developed. No clear trend of concentration of intra-European traffic on the primary hubs was found. Regarding intercontinental flights, however, they increased their market share. Passenger growth had often been driven by the expansion of interline traffic feeding international routes through major airports such as Heathrow. The results also suggested that smaller airports had become more important with respect to intra-European traffic and showed further growth potential (Burghouwt & Hakfoort 2001; Dennis 1999, 2000, 2001; De Wit, Uittenbogaart & Wei-Yun 1999; White 2002).

In general, increasing airline deregulation had opened up markets to competition between airlines and also airline alliances. Although O&D airports benefited from a quasi monopoly position in their catchment area, competition between alliances developed which focused on transfer passengers and connecting services through hub airports. As an overall result, flight frequencies increased and fares declined, which in turn increased the relative importance of airport fees in the average airfare. This development gathered pace by the advent of the low-cost carriers in the mid-nineties (Barrett 2000; Humphreys 2003; Lawton 2002; Starkie 2002).

In the past, the world of non-competing airlines had been mirrored by a world of non-competing airports. In order to compensate for market imperfections and to prevent airport operators considered natural monopolists from exploiting market power and collecting an economic rent, airports had been subjected to economic regulation like other

utility industries. Hence, aeronautical charges at sample airports may to a certain extent reflect different regulatory regimes. The application of the single-till concept in the UK is resulting in comparatively lower airport fees, since cross-subsidised by revenue from commercial activities. This method is similar to the residual approach in the US. Under the continental European dual till model, in contrast, commercial proceeds are not taken into consideration. Since these regimes allow to recover the costs of the provision of airport infrastructure and services, airport charges tend to be higher (ABN-AMRO 1998, 2000; Barrett 2000; Centre for the Study of Regulated Industries, CRI, 2001, 2003; Starkie 2002).

On the other hand, the effects of regulation on airport charges must not be unduly overestimated. Firstly, within the European Union rules, aeronautical charges need to be transparent and cost-related anyway. And secondly, airports have a built-in incentive to avoid eventual exploitation of potential market power. This is caused by the existence of locational rents gained from retailing and property activities and the complementary nature of demand for air services and retail spending by passengers. As long as the location rents are of sufficient magnitude to compensate for lower aeronautical charges, there is a strong incentive to keep aeronautical charges lower than monopoly level. From this perspective, economic regulation of airports may be considered questionable in principle and may be even dysfunctional (ACI Europe 1997b; Humphreys & Francis 2000; Pilling 2003; Starkie 2002).

### 4.2.2 Empirical Data of Sample Airports

#### 4.2.2.1 Collection and Treatment of Data

ACI, CAA, ADV and/or CIPFA traffic statistics may deviate slightly in some instances. Moreover, data submitted by sample airports to these institutions and/or published in the respective annual reports and individual airport traffic statistics is not

always in accordance with ACI/CAA/ADV/CIPFA definitions. For consistency`s sake, the definitions listed in Table 4.4 are applied throughout this study.

Table 4.4: Definition of Traffic Statistics

| **Traffic Data** | **Definition** |
|---|---|
| Total Aircraft Movements (TAM) | Air transport movements and other movements |
| Air Transport Movements (ATM) | International, domestic, scheduled and non-scheduled movements |
| Other Movements | General aviation, military and miscellaneous movements |
| Terminal Passengers | Total passengers (international, domestic, scheduled, non-scheduled, other traffic, transfer), excluding transit passengers |
| Air Cargo | Air freight and air mail, excluding trucking |
| Work Load Unit (WLU) | One terminal passenger or 100kg of air cargo |

Where in the course of the subsequent analysis data is grouped according to airport size and/or regional criteria this is based on the parameters as per Table 4.5 below.

Table 4.5: Ten-year Average Annual Traffic Throughput (in millions of passengers per annum = mppa) and Overall Growth Rates 1990-1999

| **Terminal Passengers** | **British Isles** | | | **Mainland Europe** | | |
|---|---|---|---|---|---|---|
| | **Airport** | **PAX (m)** | **Growth** | **Airport** | **PAX (m)** | **Growth** |
| PAX < 4 mppa | LPL | 0.682 | 194% | BSL | 2.392 | 91% |
| | CWL | 0.937 | 125% | NAP | 2.541 | 84% |
| | LBA | 0.988 | 91% | HAJ | 3.862 | 83% |
| | BRS | 1.353 | 147% | | | |
| | EMA | 1.646 | 75% | | | |
| | ABZ | 2.303 | 24% | | | |
| | NCL | 2.332 | 94% | | | |
| | BFS | 2.390 | 35% | | | |
| | LTN | 2.766 | 115% | | | |
| | EDI | 3.460 | 115% | | | |
| 4 mppa < PAX < 20 mppa | STN | 4.403 | 731% | CGN | 4.441 | 92% |
| | BHX | 5.003 | 102% | MRS | 4.926 | 26% |
| | GLA | 5.425 | 60% | GVA | 5.890 | 24% |
| | **RIA** | 10.199 | 122% | HAM | 7.793 | 40% |
| | MAN | 14.013 | 73% | VIE | 8.071 | 102% |
| | | | | **BER** | 10.211 | 42% |
| | | | | BRU | 12.707 | 141% |
| | | | | DUS | 13.793 | 37% |
| | | | | CPH | 14.290 | 39% |
| | | | | ZRH | 15.316 | 62% |
| PAX > 20 mppa | LGW | 23.543 | 49% | ADR | 21.452 | 32% |
| | LHR | 52.191 | 51% | AMS | 25.318 | 127% |
| | **BAA** | 91.838 | 64% | FRA | 35.552 | 58% |
| | | | | **ADP** | 55.366 | 47% |

Airport systems = **bold**

Detailed background information i.e. on ownership structure or investment activities is provided in Appendix B.1, Airport Specifics. Basic operational and financial data of all sample airports is summarized in Appendix B.2, Summary of Key Data.

As discussed during the review of existing research, raw data will be analysed. No attempt is made to create a theoretical 'standard airport' by adjustments. What the investor – institutional, strategic, or private – is interested in is the real business as it stands and may be invested in. Furthermore, any data adjustments might hide potential areas fur future improvement as compared to best practice.

Regarding the DEA time series over a period of ten years it is quite obvious that any data adjustments could even be misleading. Since DEA creates a single measure for overall performance relative to the respective sample airports, no essential parts of the business should be excluded, even if not undertaken by its peers.

All monetary data will be converted into Euros for the fiscal year 1999 and ECUs for the previous years, respectively. Neither special drawing rights nor purchasing power parities will be applied in this entirely European setting. Moreover, from the investor's point of view prevailing market conditions in terms of foreign exchange rates is what really matters; he is not concerned about equalizing the buying power of different currencies but about how much money he actually needs to shell out and probably to finance for an acquisition.

In general, the application of unadjusted raw data in Euro/ECU serves the purpose of consistency with the basis of standard financial ratio analysis and analysis of share price performance with respect to the quoted companies, and for benchmarking return rates as for example published in the Fortune 500, Flight International's Aerospace Top 100 and by investment banks and brokers which are active in the aviation industry.

Problems of comparability occur in nearly all inter-company benchmarking though, and the airport industry is no exception to this rule. The relationships among the data in the

financial statements will somehow differ across firms, if for no other reason than that the underlying transactions may be somewhat different. Variations in the scope of activities may affect some performance indicators. Therefore, individual factors potentially affecting the performance of an airport have to be borne in mind when interpreting results. At this point, some general as well as specific observations of interest will be presented.

#### 4.2.2.2 Factors Affecting the Performance of Individual Airports

Comparing sample data to one another may reveal considerable differences between airports, i.e. regarding the number of employees, or apparently unusual tax rates. While varying scopes of activities and degrees of outsourcing are reflected by corresponding staff numbers, taxes appear to be a more complex matter.

In some cases, taxes paid, tax rate and net profit seem to be contradicting. First of all it has to be pointed out that 'taxes paid' does not only include income taxes but also other tax obligations, i.e. VAT etc. Therefore, some airports showing very low or even negative income still have to pay taxes. During 1990-1995, CGN for example paid all its income as taxes to the public owners, therefore the tax rate is 100% for this period and net profit is zero. MRS has a very high tax rate, on average higher than 800%. In this case, taxes paid does not reflect exclusively income tax but also payments made to the public owner under the specific concession agreements. On the other hand, there are several publicly owned airports which are tax exempt or pay only very little taxes. Airports like BSL, GVA and ZRH are completely tax exempt whereas RIA and AMS are exempt from corporate tax in their home country.

The following brief snapshots will introduce the sample airports of the present study and indicate areas which may affect the individual performance during the period under consideration. Additional background information is compiled in the Appendices B.1, Airport Specifics, and B.2, Summary of Key Data.

ABZ = Aberdeen, UK

ABZ is owned by BAA plc, whose stock is 100% privately owned since 1987. ABZ handles mainly scheduled domestic traffic. One specific characteristic of ABZ is the strong helicopter activities to support off shore oil gas stations. During the '90s, the number of passengers increased by 24%, while cargo decreased by 26%.

Size 1999: ◆ 103,985 total aircraft movements ◆ 2.5 mio total PAX ◆ 5,933 tn cargo

ADP = Aeroports de Paris, France

ADP is an airport system consisting of two main airports CDG (Roissy-Charles-de Gaulle) and ORY (Orly) as well as 12 comparatively small local airports. ADP is publicly owned. CDG mainly handles scheduled international traffic, whereas ORY handles mainly scheduled domestic traffic. During the '90s, the number of passengers at CDG increased by 93%, while ORY increased by 4% only. Cargo handling at CDG increased by 89% and ORY declined by 53%. The local airports' main activities are business and general aviation traffic. About 50% of ADP aircraft movements are generated by the local airports.

ADP has been very actively investing in its existing facilities throughout the '90s. This will continue under the investment planning for the period until 2005. The main focus is on CDG. The airport saw a large-scale development such as terminal extensions, a new runway and a second control tower. However, ORY cannot increase in size and therefore activities are concentrating on providing quality and comfort. Furthermore, ADP started several engagements abroad and overseas in the course of the '90s.

Size 1999 CDG: ◆ 475,731 TAM ◆ 43.6 mio total PAX ◆ 1,226,427 tn cargo

Size 1999 ORY: ◆ 245,686 total aircraft movem. ◆ 25.3 mio total PAX ◆ 134,612 tn cargo

Size 1999 Le Bourget and others: ◆ 989,247 total aircraft movement ◆ 0.1 mio total PAX

ADR = Aeroporti di Roma, Italy

ADR consists of two airports, being FCO (Fiumicino) and comparatively small CIA (Ciampino). Management of the airports is carried out under a concession granted by the Italian Ministry of Transport and Shipping which is due to expire in 2044. Originally, ADR was publicly owned. In 1997, ADR was partially privatised. During the next years the privatisation process continued and in 2000 ADR was fully privatised. FCO mainly handles scheduled traffic, whereas CIA focuses on non-scheduled traffic. During the '90s, the number of passengers at FCO increased by 32% and at CIA by 20%. Cargo handling at FCO declined by 35%, whereas CIA increased its cargo handling by 176%. ADR performs ground handling services.

Since its partial privatisation in 1997, ADR invested 947mio USD in its airports. The investment was mainly for upgrading and modifying existing facilities. In the year 2000, FCO opened a new domestic passenger terminal. Since 1997, ADR started engagements abroad and overseas.

Size 1999 FCO: ◆ 260,581 total aircraft movem. ◆ 24.0 mio total PAX ◆ 185,153 tn cargo

Size 1999 CIA: ◆ 25,115 total aircraft movements ◆ 0.7 mio total PAX ◆ 14,616 tn cargo

AMS = Amsterdam, Netherlands

AMS airport is the major constituent of the Schiphol Group which also holds smaller airports such as RTM (Rotterdam), Lelystad (1993) and 50.5% of Eindhoven (1998). The Schiphol Group is publicly owned. Its main focus is clearly on AMS (Amsterdam) which handles mainly scheduled international traffic. In the course of the '90s, the number of passengers at AMS increased by 125% and by 116% at RTM. Cargo handling at AMS increased by 94%, while at RTM cargo handling declined by 48%.

AMS airport is constantly investing in its facilities. A fifth main runway was opened in 2003 and further extensions of the facilities were initiated to handle

approximately 40 mio plus passengers. During the '90s, a terminal extension and fifth pier were opened. Between 1984 and 1995, Schiphol Group invested in the new main terminal, an eight years project for a single client. Since the early '90s, AMS is a major hub. Besides investment activities regarding its own airports, Schiphol Group increased its engagements abroad and overseas since 1997. It was exempt from corporate taxes in the Netherlands.

Size 1999 AMS: ◆ 409,999 total aircraft movements ◆ 36.8 mio PAX ◆ 1,225,284 tn cargo

Size 1999 RTM: ◆ 107,727 total aircraft movements ◆ 0.6 mio PAX ◆ 1,603 tn cargo

Size 1999 others: ◆ 170,369 total aircraft movements ◆ 0.3 mio PAX ◆ 219 tn cargo

<u>BAA = BAA Group, UK</u>

The BAA Group consists of seven airports: ABZ, EDI, GLA, LGW, LHR, SOU and STN. The company is fully privatised and went public in 1987. Its stock is 100% privately owned. The majority of BAA airports handle scheduled international traffic. During the '90s, the overall number of passengers increased by 64% and cargo by 82%.

Since 1995, BAA increased its business activities in other areas besides UK airports. In 1996, World Duty Free was launched. Thus, revenue generation is no longer from airports only. Major investment activities also included the Heathrow Express. BAA started engagements in airports abroad and overseas, including investments Australia and management contracts in the USA.

Size 1999: ◆ 1,229,900 total aircraft movem. ◆ 117.4 mio total PAX ◆ 1,929,844 tn cargo

<u>BER = Berlin Group, Germany</u>

The Berlin Brandenburg Airports Holding (BBF) consists of three airports: TXL (Tegel), SXF (Schoenefeld) and THF (Tempelhof). Berlin is a publicly owned airport system. TXL handles domestic and international traffic, whereas THF primarily handles domestic traffic, while SXF handles international and non-scheduled traffic. During the

'90s, the number of passengers in TXL increased by 44%, SXF decreased by 1% and THF by 855%. Cargo handling at TXL increased by 6%, whereas SXF saw a decrease of 40% and THF by 62%.

The three airports were merged to Berlin's airport system after the German reunification and are being held by the BBF Group established in 1992. Since financial group data for the years 1992 and 1993 is biased by merger effects and thus not representative, BER is included in the data analysis for 1994-1999 only.

Investment activities in the course of the '90s were moderate and mainly for renovation and modernisation of existing facilities. SFX opened a new cargo centre in 1999 and THX extended its main runway by 300 m in 1996. Plans for privatisation and construction of a new single airport for Berlin, related land acquisition as well as other costs in the aftermath of the reunification had a significant influence on the investment volume and financial performance of the Berlin Group.

Size 1999 TXL: ◆ 124,795 total aircraft movements ◆ 9.6 mio total PAX ◆ 31,552 tn cargo

Size 1999 SXF: ◆ 43,419 total aircraft movements ◆ 1.9 mio total PAX ◆ 9,935 tn cargo

Size 1999 THF: ◆ 49,429 total aircraft movements ◆ 0.9 mio total PAX ◆ 166 tn cargo

<u>BFS = Belfast, UK</u>

Originally, BFS (Belfast International Airport) was publicly owned. The airport was fully privatised via a management buyout in 1994. In 1996, the airport was acquired by TBI. BFS handles mainly scheduled domestic traffic. During the '90s, the number of passengers increased by 35% and cargo handling by 33%.

In the early '90s, BFS invested into a new cargo complex, including an apron extension. Since the beginning of the year 2000, BFS is investing in additional apron space and two new freight buildings.

Size 1999: ◆ 101,453 total aircraft movements ◆ 3.0 mio total PAX ◆ 40,461 tn cargo

BHX = Birmingham, UK

BHX is a partially privatised airport, where the ownership structure has changed several times during the '90s. In the late eighties, BHX explored alternative ways of off-balance sheet financing of a terminal expansion by establishing the Eurohub Ltd., in which it held a 25% equity stake only. BHX handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 102% and cargo handling by 9%.

Throughout the '90s, BHX invested into the modernization of airside and landside facilities which included the second terminal opened in 1991. Since the beginning of the year 2000, a terminal linkage and several improvement activities on railway links are under construction.

Size 1999: ◆ 118,368 total aircraft movements ◆ 7.0 mio total PAX ◆ 30,304 tn cargo

BRS = Bristol, UK

BRS was publicly owned until its partial privatisation in 1997. Since 2001, BRS is fully privatised after the acquisition by Macquarie Bank/Cintra Concesiones (Ferrovial). BRS handles mainly charter and non-scheduled traffic. Around 50% of aircraft movements stem from general aviation, as a high number of business and private aircraft are based at BRS. During the '90s, the number of passengers increased by 147% and cargo handling by even 174%.

Before partial privatisation in 1997, BRS actually had no funds available for major investments. Since 1998, however, the airport underwent major investment activities. The old terminal was refurbished and modernised; construction works on the second terminal were started and finally completed in the year 2000. At that time the old terminal was closed for the public.

Size 1999: ◆ 61,723 total aircraft movements ◆ 2.0 mio total PAX ◆ 8,265 tn cargo

BRU = Brussels, Belgium

Brussels Airport Terminal Company (BATC) was a fully privatised company until the end of 1997. It was a terminal operator only, specifically designed to finance the construction of a new terminal and did not operate the entire airport. Thus, BATC did not earn and record landing charges but only passenger fees. In 1998, the company was merged with BAAA, the airport activity branch of the Belgian Airport and Airways Agency, into the new self-governing public company Brussels International Airport Company (BIAC). This new legal entity is combining airside and landside operations. For consistency's sake, BRU data is applied to the data analysis for the period of 1990 to 1997 only. BRU handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 83% and cargo by 102%.

BATC had been established as a private entity in 1987, in order to finance and manage the passenger building, including refurbishing and managing of the existing facility, as well as the construction and management of new extensions. These terminals became operational in 1994 and 2002. One specific characteristic of BRU – or rather BATC – is that almost all activities are outsourced, resulting in a very low number of employees.

Size 1999: ◆ 313,929 total aircraft movements ◆ 20.0 mio total PAX ◆ 656,302 tn cargo

BSL = Basel Mulhouse, Switzerland/France

BSL is a publicly owned airport. It handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 91% and cargo handling by 152%.

Since 1997, major investment activities are taking place in order to extend and enlarge existing facilities until 2004. BSL is a completely bi-national airport situated entirely within French territory, though it has a Swiss customs sector connected to Basel via a customs road. In the framework of the state agreement of 1949, the 'EuroAirport' is a

public law company under international law, domiciled in France. Based on this agreement, the airport does not record any shareholders' funds.

Size 1999: ◆ 124,956 total aircraft movements ◆ 3.6 mio total PAX ◆ 72,932 tn cargo

CGN = Cologne, Germany

CGN is a publicly owned airport. It handles mainly scheduled domestic traffic. In the course of the '90s, the number of passengers increased by 92% and cargo by 128%. In 1999, the airport became a cargo-hub. CGN is not subject to a night curfew. It is also performing ground handling services.

During the '90s, CGN invested into new facilities, including car parking facilities, a control tower and a new passenger terminal which opened in 2000. Until 1995, the airport recorded zero net profit as all income before taxes was paid as tax to the public owners.

Size 1999: ◆ 151,335 total aircraft movements ◆ 6.1 mio total PAX ◆ 410,436 tn cargo

CPH = Copenhagen, Denmark

In 1990, Copenhagen Airports A/S was established as the owner of CPH (Kastrup) and Roskilde airports. The airport is partially privatised since 1994. CPH is a hub airport and handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 39% and cargo handling by 82%. Roskilde handles general aviation traffic which decreased by 37%.

In 1989 and 1992 new facilities went operational, such as a domestic terminal, car parking and cargo facilities. Since 1998, the airport underwent major investment activities in modernizing and extending existing facilities. In 1998, CPH started engagements abroad and overseas.

Due to the conversion and change in ownership in October 1990, the respective financial and traffic data of Copenhagen Airport Authority and of Copenhagen Airports

A/S were aggregated in order to cover the full accounting period January to December. Moreover, some financial data was reclassified in establishing the new legal entity.

Size 1999 CPH: ◆ 298,533 total aircraft movem. ◆ 17.5 mio total PAX ◆ 315,348 tn cargo

Size 1999 Roskilde: ◆ 96,214 total aircraft movements ◆ 0.03 mio total PAX

CWL = Cardiff, UK

Originally, CWL was publicly owned. In 1995, the airport was fully privatised upon acquisition by TBI. CWL handles mainly non-scheduled traffic. During the '90s, the number of passengers increased by 125%, while cargo decreased by 13%.

After its acquisition by TBI in 1995, the airport underwent major investment activities in upgrading existing airport facilities.

Size 1999: ◆ 65,293 total aircraft movements ◆ 1.3 mio total PAX ◆ 2,854 tn cargo

DUS = Dusseldorf, Germany

DUS was publicly owned until the end of 1997. Since 1998, the airport is partially privatised by the sell-off of a 50% equity stake to a consortium of HochTief Airports and AerRianta. DUS handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 37% and cargo by 20%.

Throughout the '90s, DUS invested in existing facilities and added more facilities such as car parking and a new parallel runway which was completed in 1992. However, only conditional operation of this runway is permitted by the local authorities.

In 1996, a fire accident in the passenger terminal interrupted the entire airport operation. This event clearly had a negative impact on the financial performance of the airport and subsequent data is dominated by knock-on effects and not representative, including i.e. reconstruction costs of a terminal building and insurance proceeds.

Therefore, DUS is included in the data analysis only for the years before the fire accident, which is the period of 1990 up to and including 1995.

Size 1999: ◆ 194,065 total aircraft movements ◆ 15.9 mio total PAX ◆ 61,541 tn cargo

EDI = Edinburgh, UK

EDI is owned by BAA plc, whose stock is 100% privately owned since 1987. EDI handles mainly scheduled domestic traffic. During the '90s, the number of passengers increased by 115% and cargo by 233%. The high growth of cargo reflects the fact that EDI has steadily developed into an important freight centre.

In 1996 and in 1999, two major investment programmes were started in order to improve and extend existing facilities.

Size 1999: ◆ 101,192 total aircraft movements ◆ 5.1 mio total PAX ◆ 48,176 tn cargo

EMA = East Midlands, UK

EMA was fully privatised upon acquisition by National Express in 1993 and sold on to Manchester Airport in 2001. EMA handles mainly non-scheduled traffic. During the '90s, the number of passengers increased by 75%, but cargo handling by an outstanding 584%. Since 1993, EMA has established itself as a major hub for cargo and Royal Mail.

During the ownership of National Express major investment activities took place. In 1995, a new freight apron was completed and one year later the terminal extension. Then followed the upgrading of existing passenger infrastructure, including the expansion of public transportation and railway extension, as well as a new control tower.

Upon privatisation in 1993, EMA changed the reporting period from fiscal year ending 31 March to calendar year ending 31 December. Therefore, data for 1993 is for the nine months April to December only.

Size 1999: ◆ 72,712 total aircraft movements ◆ 2.2 mio total PAX ◆ 142,345 tn cargo

FRA = Frankfurt, Germany

FRA was a publicly owned airport until its partial privatisation via an initial public offering (IPO) in 2001; 29% of its stock is floated ever since. FRA handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 58% and cargo by 22%. FRA is the major hub in continental Europe airport. It also delivers ground handling services performed by own staff.

Throughout the '90s, FRA underwent major investment activities such as a new cargo centre and a new passenger terminal as well as a long-distance train station. For the years to come a new runway plus terminal are in planning. Since the late '90s, the airport started several engagements abroad and overseas.

Size 1999: ◆ 439,093 total aircraft movements ◆ 45.8 mio total PAX ◆ 1,538,822 tn cargo

GLA = Glasgow, UK

GLA is owned by BAA plc, whose stock is 100% privately owned since 1987. GLA handles mainly scheduled domestic traffic. During the '90s, the number of passengers increased by 60% while cargo decreased by 53%.

Throughout the '90s, GLA invested in its existing facilities, including major extensions of the terminal building, the car park facilities and the apron space.

Size 1999: ◆ 101,339 total aircraft movements ◆ 6.8 mio total PAX ◆ 12,026 tn cargo

GVA = Geneva, Switzerland

GVA is a publicly owned airport. It handles mainly scheduled international traffic. In the '90s, the number of passengers increased by 24%, while cargo decreased by 22%.

GVA had an investment plan in place to the amount of 500mio CHF which was supposed to be realised between 1998 and 2005. It involves the improvement and extension of the terminals, including a y-shaped satellite terminal to serve wide body jets.

Until 1992, the airport's balance sheet data was reported under the State of Geneva. In 1993, GVA's assets were partially reported and the complete balance sheet data is accounted for in the airport's general ledger since 1994, when it became an independent public organization.

Size 1999: ◆ 159,256 total aircraft movements ◆ 7.0 mio total PAX ◆ 51,320 tn cargo

HAJ = Hanover, Germany

Originally, HAJ was a publicly owned airport. In 1998, the airport was partially privatised by the sell-off of a 20% equity stake to Frankfurt airport (FRA) and additional 10% to a bank involved in the transaction (Norddeutsche Landesbank). HAJ handles mainly international traffic. During the '90s, the number of passengers increased by 83%, while cargo decreased by 33%. HAJ also performs ground handling services.

In the course of the '90s, HAJ invested into existing facilities such as apron and aircraft stands. Additional new facilities were added, such as car parking facilities and in 1998 a new passenger terminal was inaugurated.

Size 1999: ◆ 94,711 total aircraft movements ◆ 5.1 mio total PAX ◆ 14,671 tn cargo

HAM = Hamburg, Germany

HAM was a publicly owned airport until the year 2000, when the airport was partially privatised by the sell-off of a 50% equity stake to a consortium of HochTief Airports and AerRianta. HAM handles mainly scheduled domestic traffic. During the '90s, the number of passengers increased by 40%, while cargo decreased by 10%. HAM performs ground handling services.

Throughout the '90s, HAM invested into its existing facilities and added more parking facilities and apron. In 1994, a new passenger terminal went operational.

Size 1999: ◆ 156,525 total aircraft movements ◆ 9.5 mio total PAX ◆ 52,423 tn cargo

LBA = Leeds Bradford, UK

LBA is a publicly owned airport. It handles almost equal shares of scheduled/non-scheduled and domestic/international traffic. During the '90s, the number of passengers increased by 91%, while cargo handling decreased by 57%.

The investment activities at LBA focused mainly on the passenger terminal. In 1998, a major expansion of the terminal was completed. In 2001, new and extended passenger facilities were completed.

Size 1999: ◆ 63,954 total aircraft movements ◆ 1.5 mio total PAX ◆ 236 tn cargo

LGW = London Gatwick, UK

LGW is owned by BAA plc, whose stock is 100% privately owned since 1987. LGW handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 49% and cargo by 42%.

Throughout the '90s, LGW invested primarily into the redevelopment and improvement of its passenger terminals.

Size 1999: ◆ 255,569 total aircraft movements ◆ 30.6 mio total PAX ◆ 313,627 tn cargo

LHR = London Heathrow, UK

LHR is owned by BAA plc, whose stock is 100% privately owned since 1987. LHR handles mainly scheduled international traffic and is the biggest European hub airport. During the '90s, the number of passengers increased by 51% and cargo by 84%.

Throughout the '90s, LHR invested in the upgrading of its terminal buildings. Another major investment was the Heathrow Express which started operation in 1998. In 2002, permission for a fifth terminal was finally granted.

Size 1999: ◆ 458,270 total aircraft movements ◆ 62.3 mio total PAX ◆ 1,355,417 tn cargo

LPL = Liverpool, UK

LPL was first privatised in 1990. Even though 24% remained with the local authorities, the airport is considered fully privatised in terms of decision making. In 1997, Peel Airports acquired 76% of the airport and the remaining 24% in 2001.

LPL handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 194% and cargo handling by 60%.

Since Peel Airports acquired LPL in 1997, major investments were made in the upgrading of the airport facilities. In the beginning of 2000, investments were made to treble the size of the terminal and into a new control tower.

LPL experienced two changes in the reporting period. The first time was in 1990, when the cycle was changed from fiscal year ending 31 March to calendar year ending 31 December. Following the change in ownership in 1997, however, the accounting period was changed back again to the fiscal year ending 31 March.

One specific characteristic of LPL is that almost all activities are outsourced. Therefore, the number of LPL employees is very low. LPL is not subject to a night curfew.

Size 1999: ◆ 76,194 total aircraft movements ◆ 1.3 mio total PAX ◆ 42,178 tn cargo

LTN = Luton, UK

Originally, London Luton Airport Ltd. (LLAL) was publicly owned. Since 1998, the airport is being considered fully privatised in terms of decision making and financial risk based on a thirty years concession agreement granted to a third party, constituting a separate legal entity. Although the scope of operations remained basically unchanged for the concessionaire London Luton Airport Operations Ltd. (LLAO), subsequent financial data of the operating company is not comparable. As a matter of consequence, LTN data is applied to the data analysis for the period 1990/91 to 1997/98 only (CRI 1999).

LTN handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 115%, while cargo handling decreased by 10%. In the beginning of the '90s, LTN implemented a 10 years investment plan. A new passenger terminal was opened in 1990 and other airport facilities were expanded in the following years.

Size 1999: ◆ 79,793 total aircraft movements ◆ 5.3 mio total PAX ◆ 27,433 tn cargo

MAN = Manchester, UK

MAN is a publicly owned airport. It handles a high share of non-scheduled traffic. During the '90s, the number of passengers increased by 73% and cargo handling by 45%.

Throughout the '90s, MAN underwent major investment activities. The domestic terminal opened in 1989, passenger terminal T2 and the railway station were opened in 1993, and in 1998 passenger terminal T3 opened. Major activities included the extension of an existing and construction of a second runway which opened in 2001, plus additional cargo facilities. MAN continues its investment activities and started work on a ground transport interchange. Furthermore, MAN started engagements in other UK airports in 1999.

Size 1999: ◆ 185,041 total aircraft movements ◆ 17.8 mio total PAX ◆ 112,229 tn cargo

MRS = Marseille, France

MRS is a publicly owned airport and property of the French Government, conceded to the local Chamber of Commerce and Industry under a concession contract. It handles mainly scheduled domestic traffic. During the '90s, the number of passengers increased by 27% and cargo handling by 20%.

In the '90s, the investment focus of MRS was on upgrading existing facilities, followed by a complete redevelopment of the international passenger terminal.

Size 1999: ◆ 123,131 total aircraft movements ◆ 6.0 mio total PAX ◆ 58,584 tn cargo

NAP = Naples, Italy

NAP was publicly owned until 1997, when the operating company Gesac SpA was partially privatised upon the acquisition of a 70% majority stake by BAA plc. This equity share was reduced to 65% in 1999.

NAP handles mainly scheduled domestic traffic. During the '90s, the number of passengers increased by 84% and cargo decreased by 4%.

In 1990, NAP implemented a 20 years investment master plan. Major activities in this plan were the new cargo facilities, the new Terminal 2 building, additional parking facilities and the ongoing upgrading of existing facilities. Since 2001, a new cargo terminal is being built and the passenger halls are being extended.

Size 1999: ◆ 56,895 total aircraft movements ◆ 3.7 mio total PAX ◆ 4,956 tn cargo

NCL = Newcastle, UK

Initially, NCL was publicly owned. In 2001, a public private partnership was established in which CPH holds 49%. NCL handles mainly non-scheduled traffic. During the '90s, the number of passengers increased by 943% and cargo handling by 24%.

Throughout the '90s, NCL invested into the upgrading of existing facilities. These activities included a metro extension, check-in desks were added, the terminal was extended twice and new parking spaces were added.

Size 1999: ◆ 79,289 total aircraft movements ◆ 3.0 mio total PAX ◆ 4,239 tn cargo

RIA = AerRianta Group, Ireland

The AerRianta Group consists of three airports: DUB (Dublin), SNN (Shannon) and ORK (Cork). AerRianta is a publicly owned airport system. All three airports handle mainly scheduled international traffic. In the course of the '90s, the number of passengers in DUB increased by 131% and cargo handling by 124%. Passengers at SNN increased by

76% and cargo handling by 70%. ORK's passenger numbers increased by 118% and cargo handling by even 476%.

Throughout the '90s, AerRianta constantly invested into existing airport facilities. In 1989, DUB opened a new runway and control tower. During the following years, facilities were expanded and upgraded which almost doubled the public area. SNN invested into a new passenger terminal to double its passenger handling capacity. Between 1993 and 1998, ORK's terminal building was expanded to cater for one million passengers. During the same time a new freight terminal, cargo warehouse and additional office space were opened. The year 1998 was the start of the expansion and improvement of cargo facilities as well as the construction and development of a new business park.

The core business of AerRianta is airport operations and duty-free retailing. Since the mid '90s, AerRianta also started engagements in the management of duty-free operations in other countries including Russia and the Middle East via AerRianta International.

In 1999, the ownership of all remaining airport assets still held by the Minister of Public Enterprise was transferred to AerRianta based on the Air Navigation and Transport Act of 1998. Until that time the parent company of the AerRianta Group was exempt from Irish corporate tax.

Size 1999 DUB: ◆ 170,421 total aircraft movem. ◆ 12.8 mio total PAX ◆ 112,124 tn cargo

Size 1999 SNN: ◆ 51,414 total aircraft movements ◆ 2.2 mio total PAX ◆ 34,714 tn cargo

Size 1999 ORK: ◆ 43,113 total aircraft movements ◆ 1.5 mio total PAX ◆ 11,723 tn cargo

STN = Stansted, UK

STN is owned by BAA plc, whose stock is 100% privately owned since 1987. It handles mainly scheduled international traffic. During the '90s, STN saw a tremendous increase in passengers by 731% and a 448% increase in cargo.

In the 1990s, STN underwent major investments in developing the airport. These activities comprised road and railway access, a new terminal including satellites as well as apron and taxiways. In 1997, a new passenger and cargo building were opened. The financial data reflects these activities as each year's net profit was negative until 1998/99. Approval to increase the annual transport movements from 120,000 to 185,000 was granted in 1999.

Size 1999: ◆ 155,080 total aircraft movements ◆ 9.5 mio total PAX ◆ 193,986 tn cargo

VIE = Vienna, Austria

VIE was publicly owned until its partial privatisation via an IPO in 1992. The privatisation process continued over time and in the year 2000 50% of the airport's shares of stock were held by private shareholders. VIE handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 102% and cargo handling by 95%. VIE also performs ground handling services.

In the 1990s, VIE continuously invested in upgrading its facilities and equipment. In 1996, a major passenger terminal extension opened. A new investment plan is focusing on the expansion of the terminals and a new runway until 2015. Since the late '90s, VIE started engagements abroad.

Size 1999: ◆ 191,742 total aircraft movements ◆ 11.2 mio total PAX ◆ 125,585 tn cargo

ZRH = Zurich, Switzerland

Originally, ZRH was a publicly owned airport. In the year 2000, it was partially privatised and listed at the Swiss Stock Exchange as Unique Zurich Airport after a (secondary) public offering.

ZRH is a hub airport and handles mainly scheduled international traffic. During the '90s, the number of passengers increased by 62% and cargo handling by 40%.

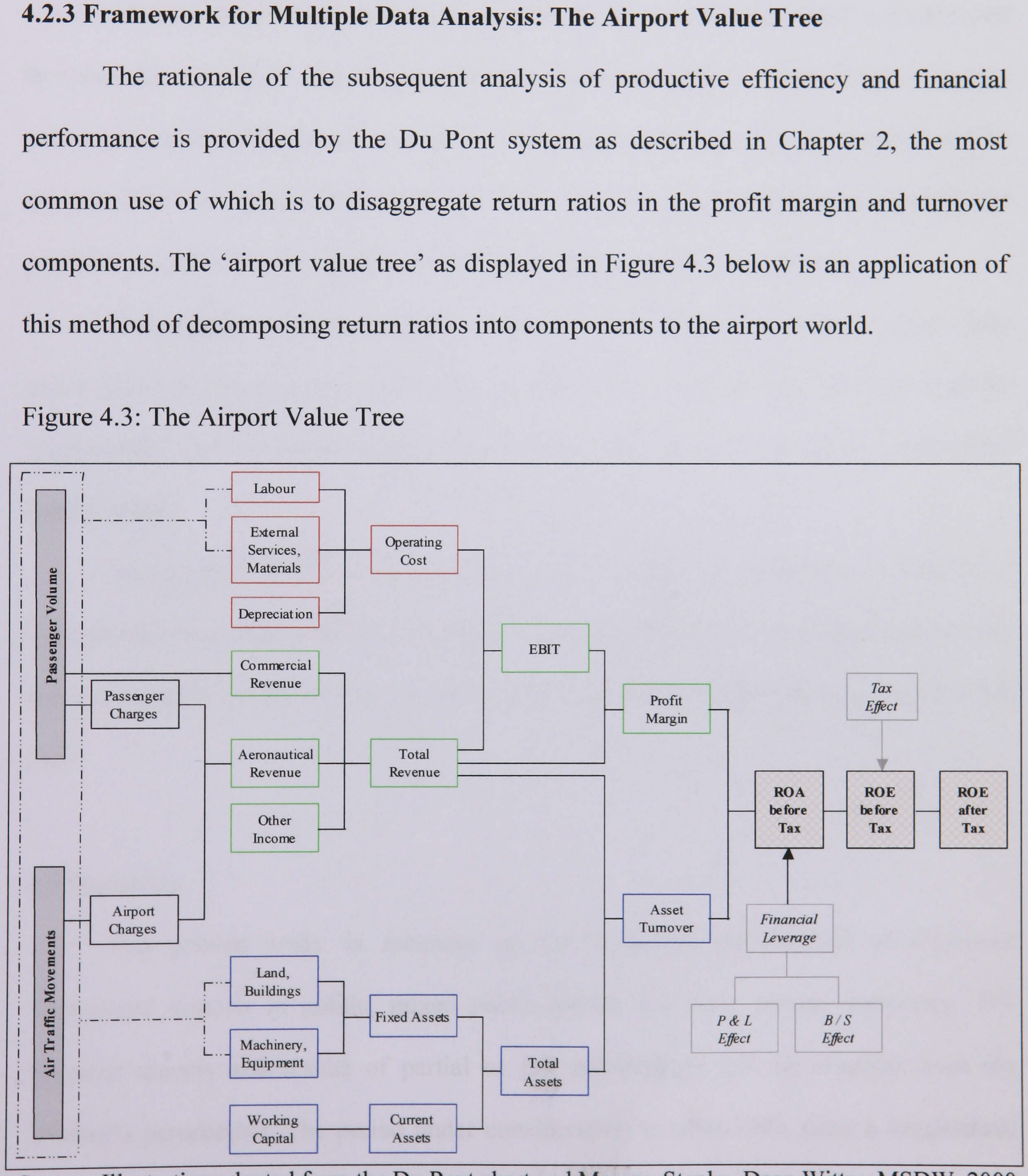
Major investments had been undertaken in the 1980s already. Throughout the `90s, the focus was on 'Airport 2000', a major investment program (2bn CHF, 1.5bn USD) to upgrade the entire airport. The most important projects include new taxiways, a midfield passenger terminal, a railway connection and an extension of the cargo centre. As a publicly owned airport ZRH did not pay taxes before the year 2000.

Size 1999: ◆ 306,182 total aircraft movements ◆ 20.9 mio total PAX ◆ 378,449 tn cargo

### 4.2.3 Framework for Multiple Data Analysis: The Airport Value Tree

The rationale of the subsequent analysis of productive efficiency and financial performance is provided by the Du Pont system as described in Chapter 2, the most common use of which is to disaggregate return ratios in the profit margin and turnover components. The 'airport value tree' as displayed in Figure 4.3 below is an application of this method of decomposing return ratios into components to the airport world.

Figure 4.3: The Airport Value Tree




Source: Illustration adapted from the Du Pont chart and Morgan Stanley Dean Witter, MSDW, 2000

The 'airport value tree' is rooted in traffic – aircraft movements and passengers. Airports create value by converting traffic into revenue by the provision of infrastructure and services. Both asset turnover and profit margin are driven by traffic volume, asset utilization and operating efficiency. The product of profit or operating margin and turnover of total assets results in the return generated by the airport's assets before taxes. The respective capital structure will exert a financial leverage and lead to return on equity. Last but not least, taxes will have to be paid.

After the performance and financial analysis, the main results of PFP and FRA will be tested for statistically significant differences between sample airports in public, mixed public-private and fully private ownership. Independent and paired-samples t-tests will be conducted to test the hypotheses stated at the outset and to examine changes in financial performance prior to and after partial or full privatisation of sample airports.

Correlational research attempts to determine whether a significant relationship exists between two or more quantifiable variables. The general purpose is to establish relationships and to derive predictions. It does not, however, establish cause-effect relationships.

The results of TFP analysis will also be examined by regression techniques to validate the input-output relationship assessed by DEA. Descriptive measures, such as size and ownership structure will be the independent variables on which the output index will vary.

## 4.3 Summary

The present study is focusing on the economic performance of European commercial airports in public, mixed public-private and fully private ownership. The financial aspects and results of partial or full privatisation will be assessed from the investor's perspective. The period under consideration is 1990-1999, since a longitudinal

study designed to properly identify differences amongst sample airports eventually attributable to ownership structure rather than external changes requires continuity.

The sample of European airports represents a cross-section, from Europe's leading London Heathrow to smaller ones like Basel and Cardiff. The sample is also fairly representative regarding geographical location, regulatory regimes and ownership structures.

Despite the strong traffic growth during the '90s, several sample airports experienced a decline of revenue in real terms. Furthermore, it needs to be borne in mind that specific factors may affect the performance of an individual airport.

The framework for the data analysis is provided by the 'airport value tree' adapted from the Du Pont system. The 'airport value tree' is rooted in traffic throughput, aircraft movements and passengers. Airports create value by converting traffic into revenue by the provision of infrastructure and services.

Based on the concepts of the analysis of partial and total factor productivity as well as financial ratio analysis comparisons are made by working out indicators and ratios for the individual sample airports as well as the sub groupings of publicly owned and privatised airports. Descriptive measures constitute the context, with 'ownership structure' as the decisive feature.

Partial factor productivity indicators and financial ratio analysis outcomes are evaluated and tested in order to investigate for statistically significant differences which may be attributable to the degree of privatisation. The sub set of airports experiencing a change in ownership during the period under consideration will be assessed prior to and after partial or full privatisation.

# CHAPTER 5

# PRODUCTIVE EFFICIENCY AND FINANCIAL PERFORMANCE

The indicators, ratios, percentages and other relationships which will be described for the sample airports are the result of analytical techniques and may isolate areas requiring further investigation. In order to take full advantage of these calculations they have to be assessed and interpreted with due consideration of the above stated background information on the state of the airport industry sector on a global scale and general economic conditions and trade cycles as the most important parameter of traffic development.

## 5.1 Partial Factor Productivity and Financial Performance

### 5.1.1 PFP Indicators

In the course of the analysis of partial factor productivity a variety of indicators were calculated as per Appendix B.3, Results of PFP. Table 5.1 summarizes the respective definitions, in which EBIT stands for earnings before interest and taxes.

Table 5.1: Definitions of PFP Indicators (Partial Factor Productivity)

| **Performance Indicator** | **Definition** |
|---|---|
| **Group 1: Cost Efficiency** | |
| Total Cost per WLU | Total Cost divided by WLUs |
| Inflation Adjusted Total Cost per WLU | Total Cost per WLU indexed to 1995 |
| Operating Cost per WLU | Operating Cost divided by WLUs |
| Inflation Adjusted Operating Cost per WLU | Operating Cost per WLU indexed to 1995 |
| Depreciation Cost per WLU | Depreciation Cost divided by WLUs |
| Inflation Adjusted Depreciation Cost per WLU | Depreciation Cost per WLU indexed to 1995 |
| Depreciation Share of Operating Cost | Depreciation Cost divided by Operating Cost |
| Labour Cost per WLU | Labour Cost divided by WLUs |
| Average Labour Cost per Employee | Labour Cost divided by Average # of Empl. |
| Labour Share of Operating Cost | Labour Cost divided by Operating Cost |
| **Group 2: Labour Productivity** | |
| WLU per Employee | WLUs divided by Average # of Employees |
| Total Revenue per Employee | Total Revenue divided by Average # of Empl. |
| **Group 3: Capital Productivity** | |
| Asset Utilization (WLU/Total Assets in '000) | WLUs divided by Total Assets in '000 |
| Total Asset Turnover (Total Rev./Total Assets) | Total Revenue divided by Total Assets |

Table 5.1: Definitions of PFP Indicators (cont'd)

| Performance Indicator | Definition |
|---|---|
| **Group 4: Revenue Generation** | |
| Total Revenue per WLU | Total Revenue divided by WLUs |
| Inflation Adjusted Total Revenue per WLU | Total Revenue per WLU indexed to 1995 |
| Aeronautical Revenue per WLU | Aeronautical Revenue divided by WLUs |
| Inflation Adj. Aeronautical Revenue per WLU | Aeronautical Revenue per WLU indexed to 1995 |
| Aeronautical Revenue per Total Aircraft Movem. | Aeron. Rev. divided by Total Aircraft Movements |
| Aeronautical Rev. per Air Transport Movement | Aeron. Rev. divided by Air Transport Movements |
| **Group 5: Commercial Performance** | |
| Non-Aeronautical Share of Total Revenue | Comm. Rev. + Other Rev. divided by Total Rev. |
| Commercial Revenue per Terminal Passenger | Commercial Revenue divided by Terminal PAX |
| Infl. Adj. Commercial Rev. per Terminal PAX | Commercial Rev. per Terminal PAX ind. to 1995 |
| **Group 6: Profitability** | |
| Revenue/Expenditure Ratio (RevEx) | Total Revenue divided by Total Cost |
| Net Income per WLU | Net Income divided by WLUs |
| Return on Total Assets (ROA) | Net Income divided by Total Assets |
| Operating Profit per WLU | Operating Profit (EBIT) divided by WLUs |
| Inflation Adjusted Operating Profit per WLU | Operating Profit (EBIT) per WLU indexed to '95 |
| Return on Capital Employed (ROCE; also: Basic Earning Power, BEP) | Operating Profit (EBIT) divided by Total Assets |

The following Figures 5.1 through 5.15 illustrate a selection of the various PFP indicators calculated. While bars are reflecting the ten-year average (arithmetic mean) of the respective indicator or ratio per airport or airport system, the red line and the individual percentages in the lower portion of the graphs mark the corresponding compound annual growth rate (CAGR) for the full period from the base year 1990 through 1999 and 1990/1991 through 1999/2000, respectively, for those cases where the reporting period is the fiscal year ending 31 March. The total sample average calculated as the unweighted arithmetic mean of all observations of the sample airports is displayed by the horizontal solid line. The BAA Group, however, is excluded from the calculation of sample averages to avoid double counting.

While monetary data for 1999 is in Euro for Euroland countries/airports, all other data was converted from local currency to ECUs for 1990-1998 and to Euro for 1999, respectively, at the prevailing exchange rates as per Datastream®. Where monetary terms are adjusted for inflation, all data is indexed to the common base year 1995 = 100 and

converted into real terms according to Datastream®/OECD price inflation indices. Where the reporting period is for the fiscal year ending 31 March, foreign exchange rates and inflators are the blended average of Quarters II-IV of the fiscal year beginning 1 April and Quarter I of the subsequent calendar year.

Bars representing airports located in the British Isles are yellow, those of airports scattered across Mainland Europe come in blue colour. As illustrated by Table 4.2 (number of fiscal years in public, mixed public-private or fully privatised ownership 1990-1999), these groups represent a high degree of fully privatised airports or public private partnerships (PPPs) versus a majority of publicly owned ones. Bars of airport systems carry bold red borders.

Key to Figures on Partial Factor Productivity

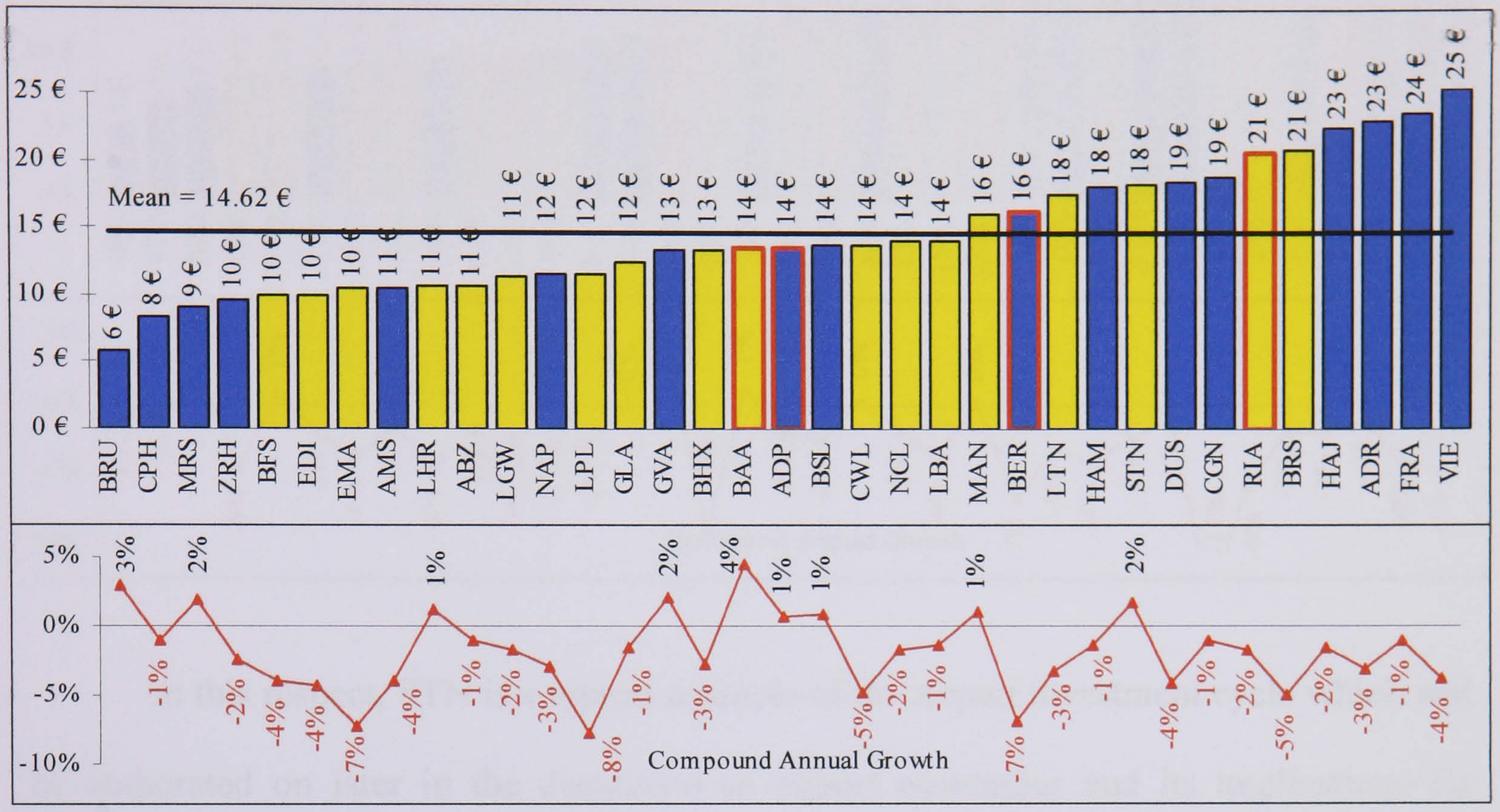
| | |
|---|---|
| Airports in the British Isles | Airports Mainland Europe |
| Airport Systems British Isles (BAA, RIA) | Airport Systems Mainland Europe (ADP, BER) |
| Sample Average/Unweighted Arithmetic Mean | Compound Annual Growth Rate |

According to Figure 5.1, there exists a considerable spread in the long-term average total cost per WLU indexed to 1995. No clear structure becomes visible and airports operating in Mainland Europe appear to be both highest and lowest on the scale. This is partially dependent on the different scope of activities.

Amongst others, both FRA and VIE provide labour intensive ground handling services, which in turn generate corresponding revenues (Figure 5.9, inflation-adjusted aeronautical revenue per WLU). Several airports in the British Isles as well as some across Mainland Europe record unit cost decreases over time which is partially attributable to the traffic growth as discussed in section 4.2.1 (European economic and traffic development in the '90s). The BAA Group's cost increase is reflecting its capacity investment

programmes, i.e. at STN and LHR, including the Heathrow Express. In general, airport systems are around sample mean, while RIA is at the higher end.

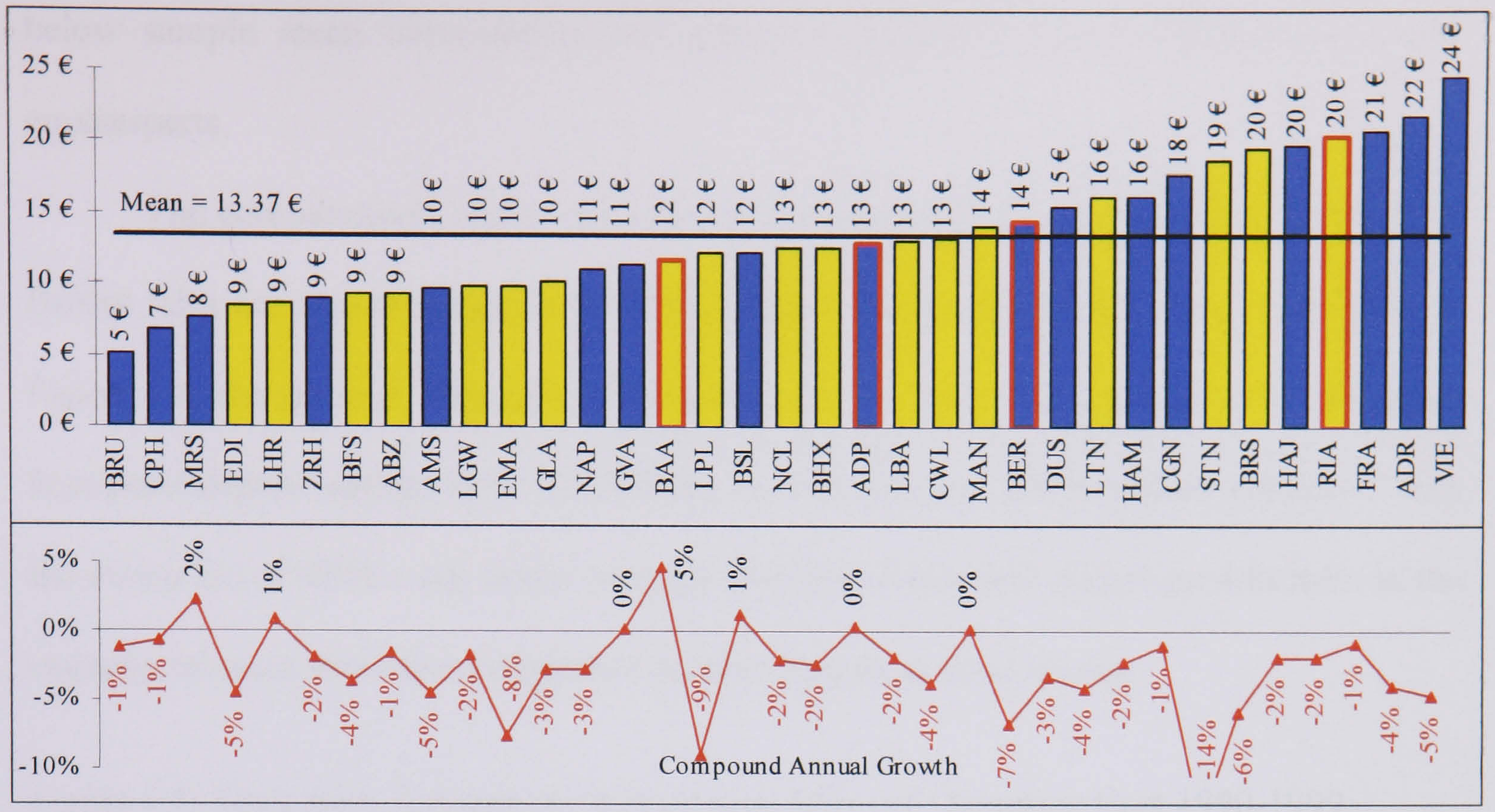
Figure 5.1: Long-term Average of Inflation-Adjusted Total Cost per WLU 1990-1999




Another peculiarity which needs to be borne in mind when comparing and interpreting outcomes of the subsequent analyses is the rare case when neither costs nor revenues are recorded in an airport's books. This applies to BRU, which in contrast to the other sample airports is exclusively a terminal operator. Therefore, it does not earn landing charges, with implications for total and aeronautical unit revenues, but also for indicators and ratios involving assets. As opposed to subcontracting of services to third parties as regards i.e. ground handling, this is a different matter. In the case of BRU, the operator is legally neither entitled to render such (airside) services nor to outsource it to third parties for concession income. Likewise, it is not obliged to corresponding investment activities. Hence, both activities will not enter the profit and loss account or balance sheet.

Inflation-adjusted operating unit costs (Figure 5.2) is very similar to total unit costs (Figure 5.1) above. The steep decline of STN's operating cost per WLU is due to its enormous traffic growth during the '90s.

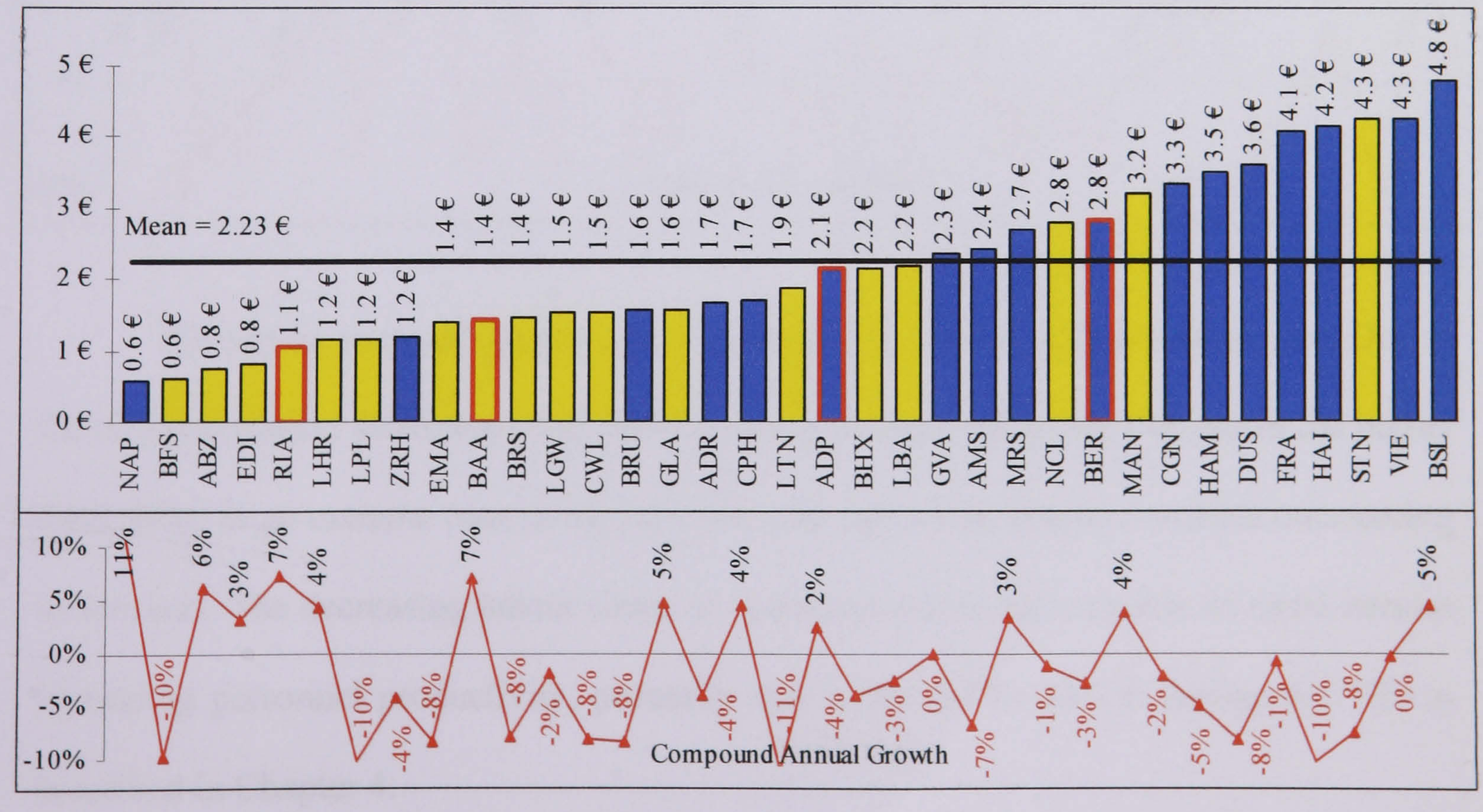
Figure 5.2: Long-term Average of Inflation-Adjusted Operating Cost per WLU 1990-1999




In this respect, STN is a typical example of the airport investment cycle which will be elaborated on later in the discussion of airport economics and its implications for valuation in Chapter 7.

Figure 5.3 displays the depreciation cost per WLU adjusted for inflation.

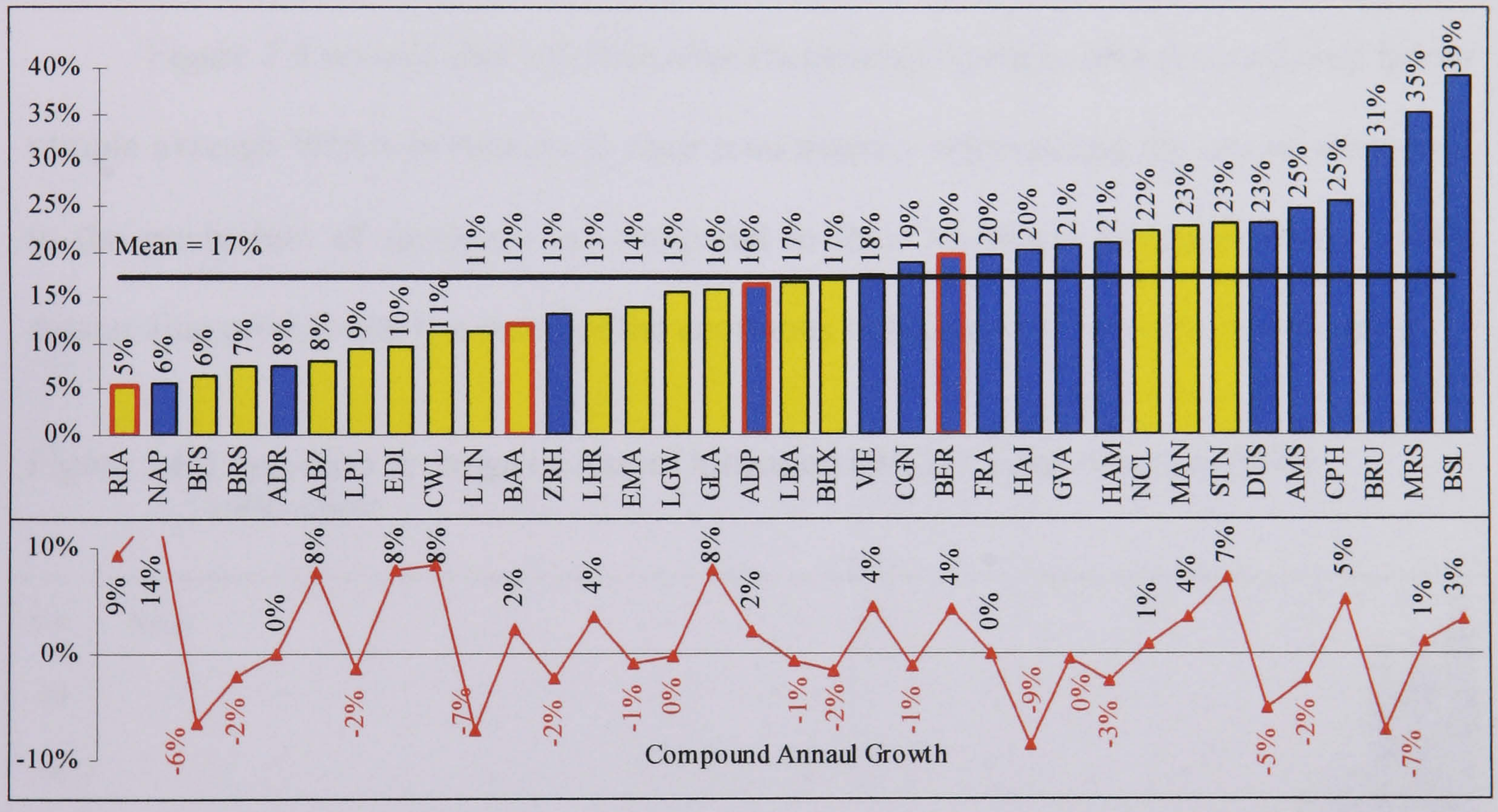
Figure 5.3: Long-term Average of Inflation-Adjusted Depreciation Cost per WLU 1990-1999



Generally speaking, airports in the British Isles record – partly considerably – below sample mean depreciation unit costs as opposed to their Mainland European counterparts.

The comparatively lower depreciation unit costs indexed to 1995 of airports in the British Isles are also reflected by the depreciation share of operating costs. According to Figure 5.4, the ten-year averages of the depreciation share of operating cost of Mainland European airports appear to be well above sample average, while airport systems – with the exception of BER – are below average. Positive compound annual growth rates in the majority of cases seem to correspond with investments in fixed assets.

Figure 5.4: Long-term Average of Depreciation Share of Operating Cost 1990-1999




The labour share of operating cost in Figure 5.5 reveals a disparate picture. Due to the aforementioned provision of ground handling services FRA and VIE are in the higher third. BRU is an extreme case at the very low end due to the almost complete outsourcing of services. The decreasing labour share of operating cost in the majority of cases implies increasing personnel productivity, primarily due to the traffic growth during the '90s as described in Chapter 4.

Figure 5.5: Long-term Average of Labour Share of Operating Cost 1990-1999

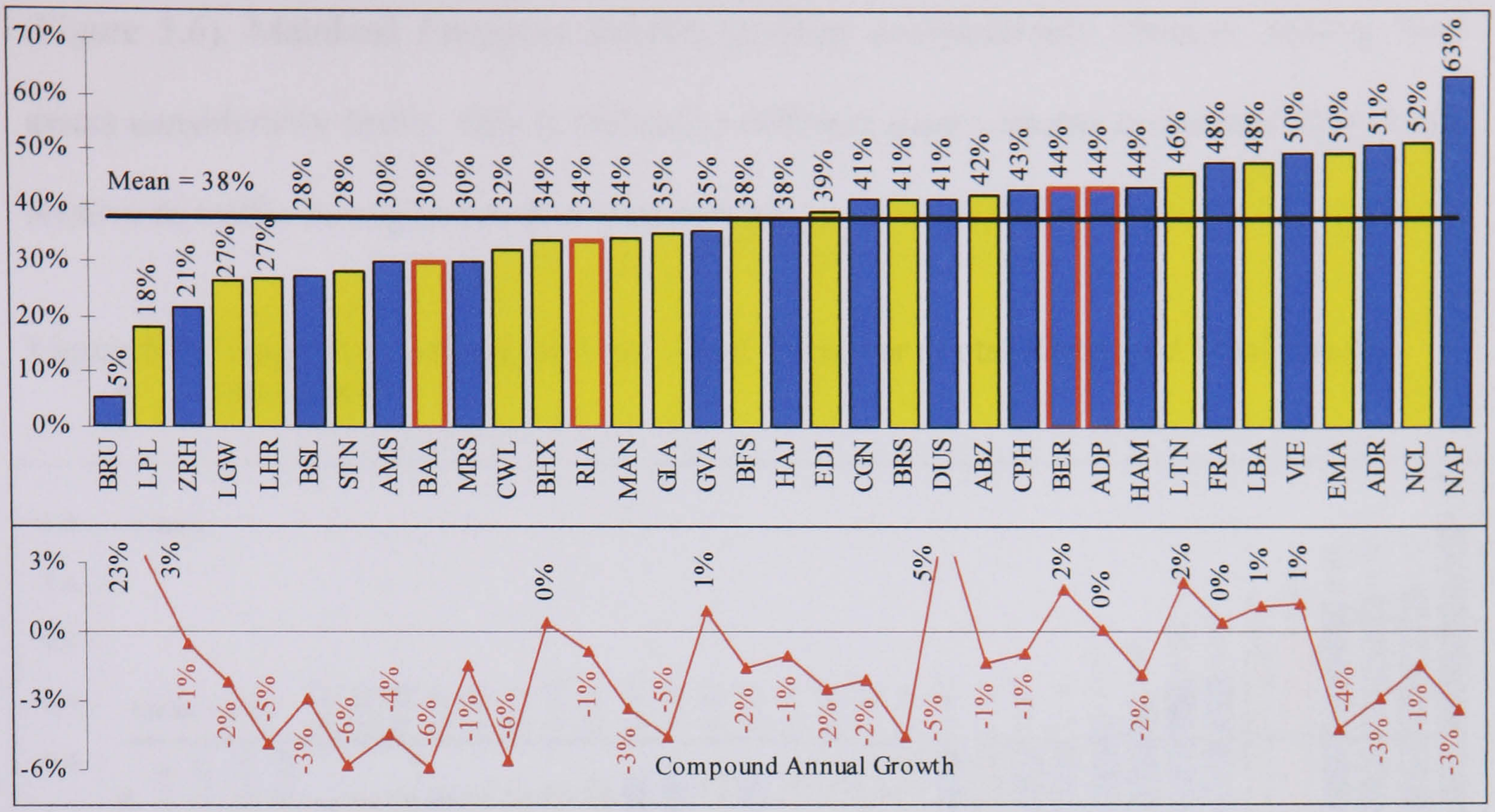
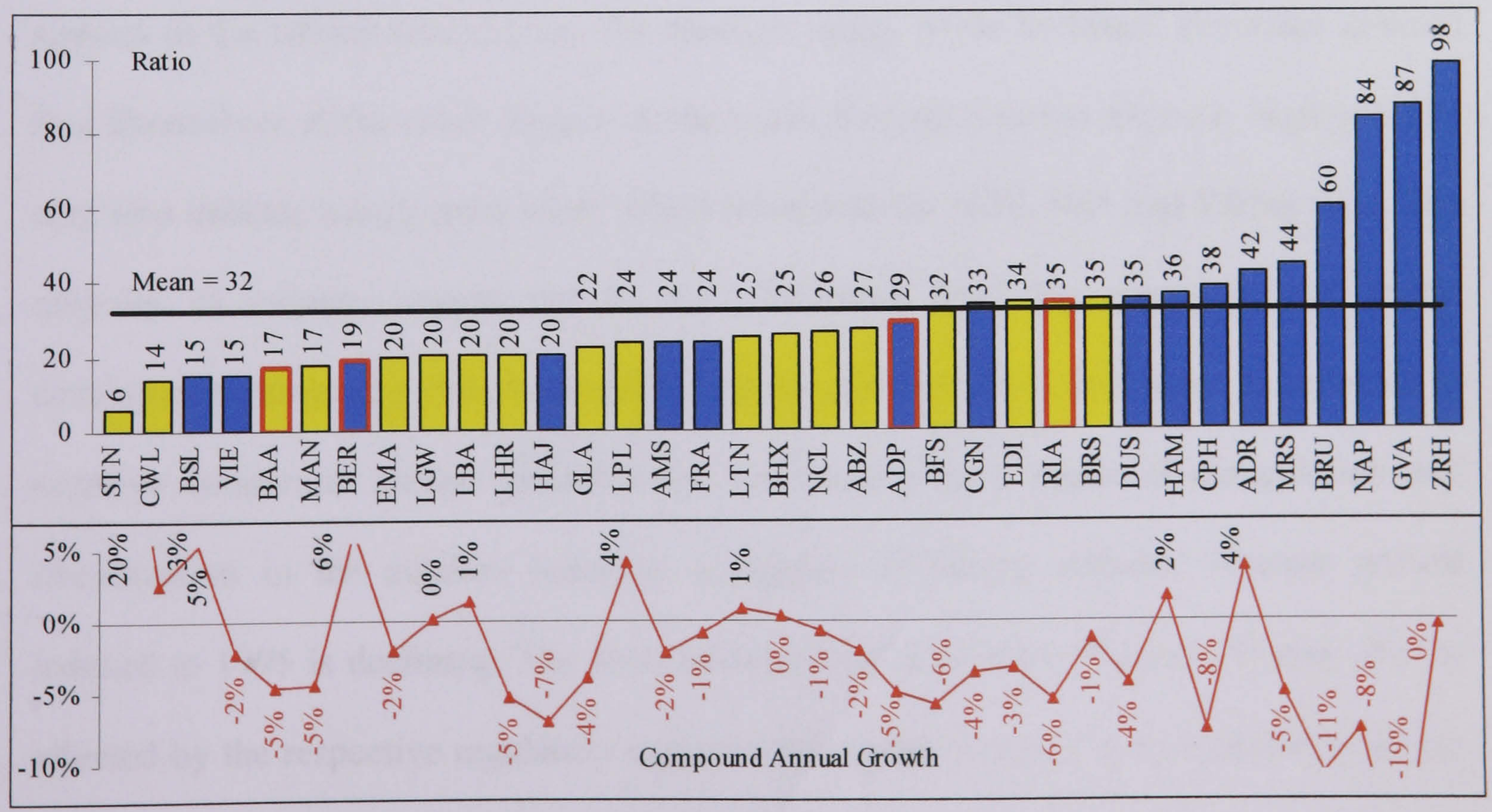


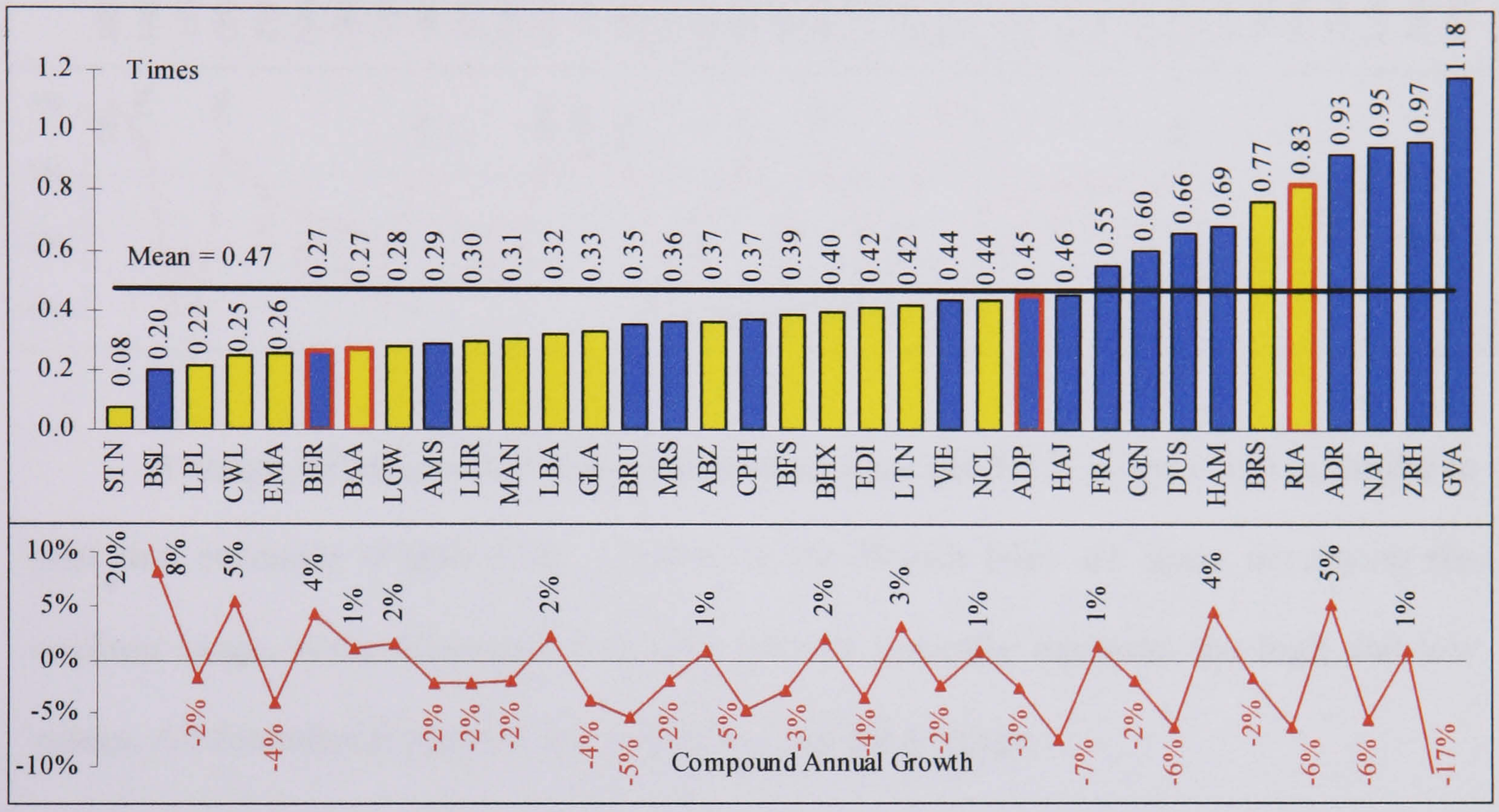

Figure 5.6 reveals that UK/Irish airports generate considerably less and well below sample average WLUs in relation to their total assets – representing the capital employed in the production of services – as compared to their Mainland European peers. STN's outstanding growth rate is a result of the enormous traffic growth since the mid-nineties.

Figure 5.6: Long-term Average of Asset Utilization (WLU / Total Assets in '000) 1990-1999



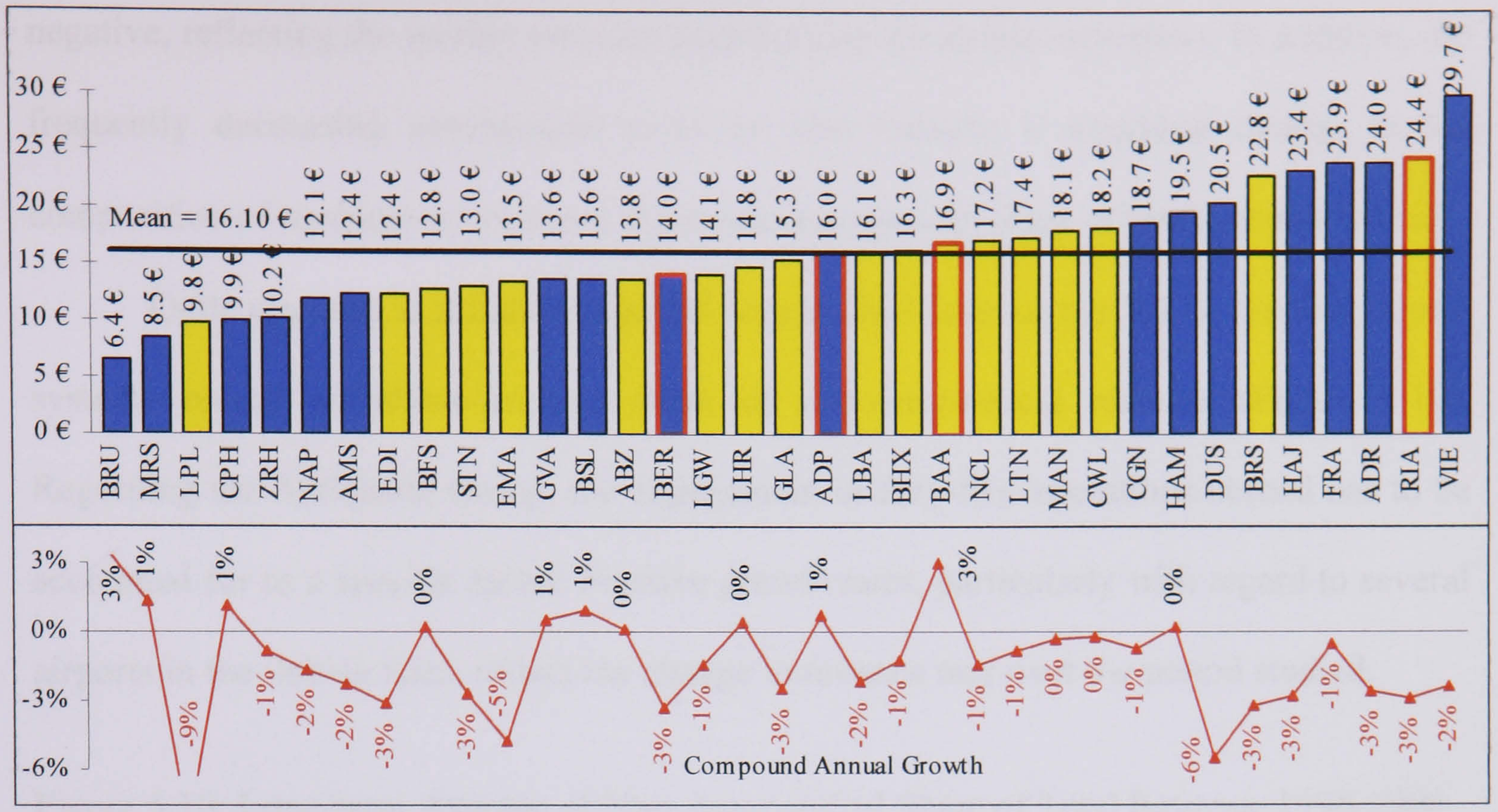
In Figure 5.7 the total asset turnover is essentially mirroring asset utilization above (Figure 5.6). Mainland European airports perform comparatively stronger, turning total assets considerably faster. This is indicating different asset volumes or balance sheet totals relative to traffic throughput and to total revenue.

Figure 5.7: Long-term Average of Total Asset Turnover (Total Revenue / Total Assets) 1990-1999



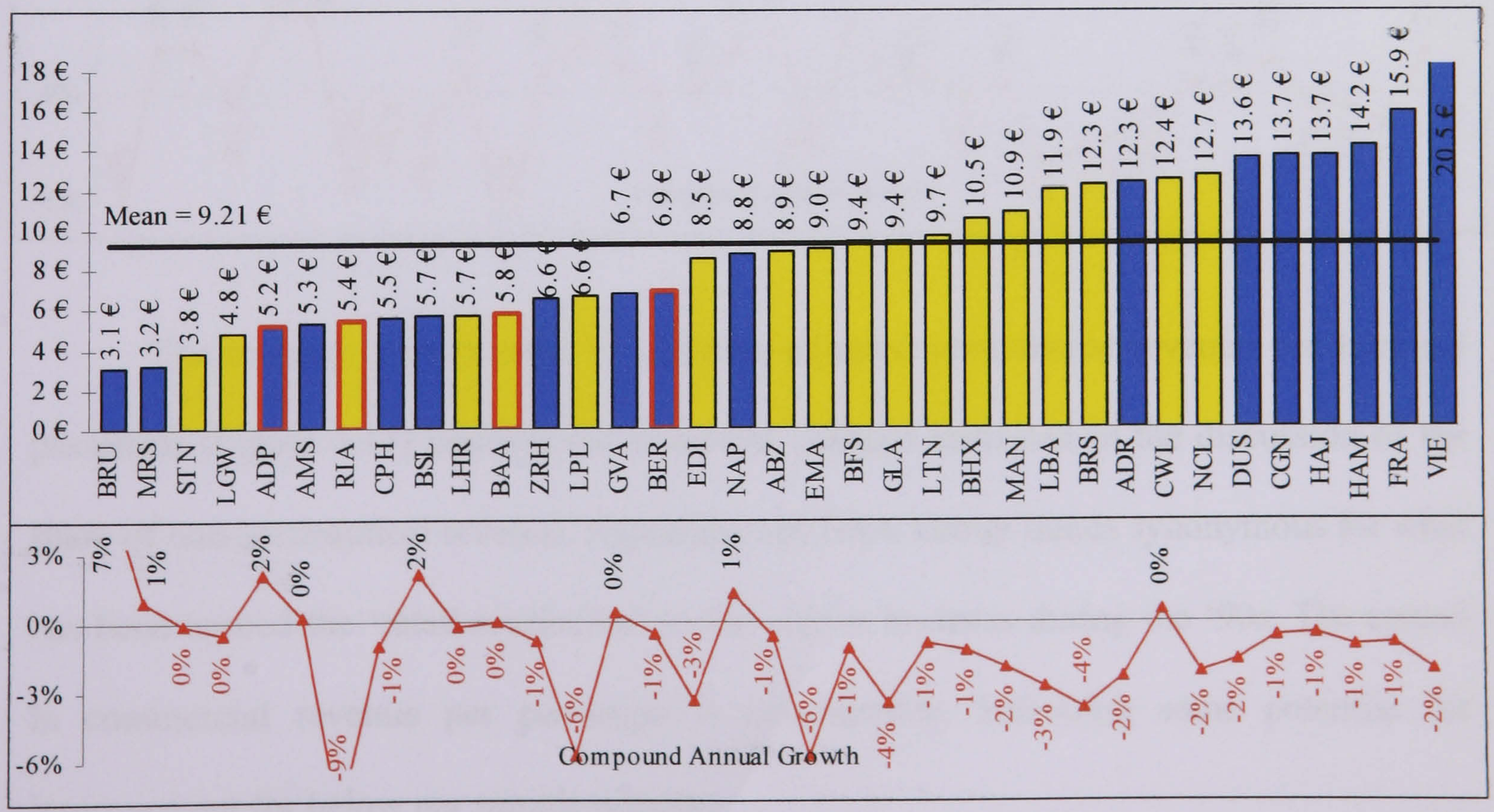

Regarding the generation of total unit revenues adjusted for inflation (Figure 5.8), airports in the British Isles occupy the medium range, while Mainland European airports find themselves at the outer fringes of the scale. Several German airports' high position may also indicate a high price level, which holds true for ADR, RIA and VIE as well. The majority of airports appear not to have benefited from the economic and traffic development during the '90s as described earlier, but lost out in real terms as reflected in negative compound annual growth rates. Presumably as a result of deregulation and liberalization in the aviation industry, a number of sample airports' revenue growth indexed to 1995 is declining. The level of aeronautical revenue (Figure 5.9) may also be affected by the respective regulatory regime which tends to result in comparatively higher airport fees in continental Europe. However, no consistent pattern has been detected.

Figure 5.8: Long-term Average of Inflation-Adjusted Total Revenue per WLU 1990-1999




Average inflation-adjusted aeronautical revenue per WLU (Figure 5.9) is similar to total unit revenues (Figure 5.8). Airports in the British Isles are again occupying the medium range, while Mainland European airports basically represent the high and low values. All four airport systems are well below sample average.

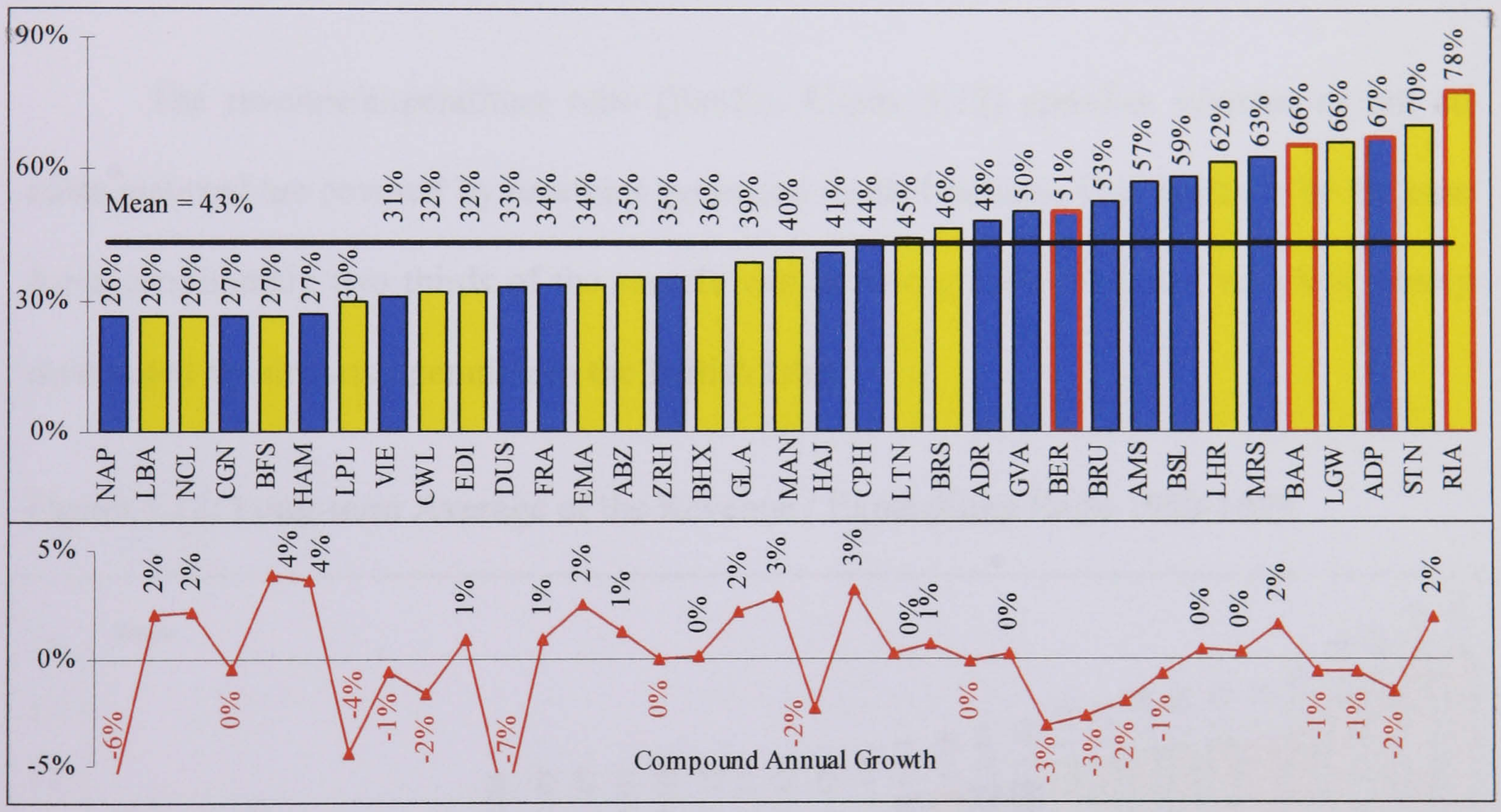
Figure 5.9: Long-term Average of Inflation-Adjusted Aeronautical Revenue per WLU 1990-1999



The inflation-adjusted growth of aeronautical unit revenues is only moderate or negative, reflecting the market pressure exercised by the airline customers. In addition, the frequently decreasing aeronautical revenues also indicate a structural change in the composition of revenues as mirrored in the non-aeronautical share of total revenue below.

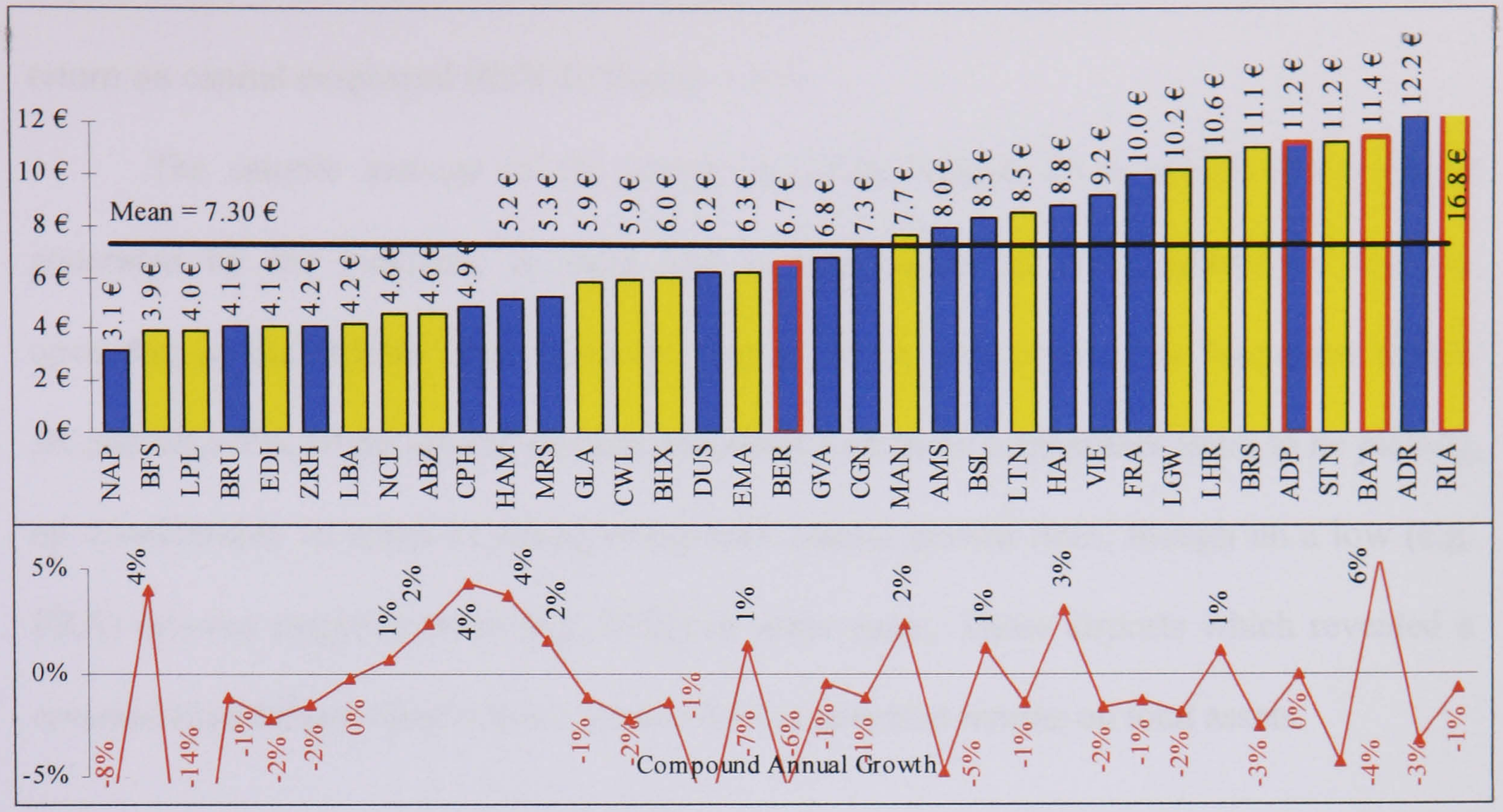
Quite opposite to inflation-adjusted aeronautical revenue per WLU, the four airport systems record an above-average share of non-aeronautical revenue (Figure 5.10). Regarding the AerRianta Group, the engagement in duty-free operations abroad has to be accounted for as a specific factor. Positive growth rates, particularly with regard to several airports in the British Isles, reflect the change in revenue mix over the period studied.

Figure 5.10: Long-term Average of Non-Aeronautical Share of Total Revenue 1990-1999



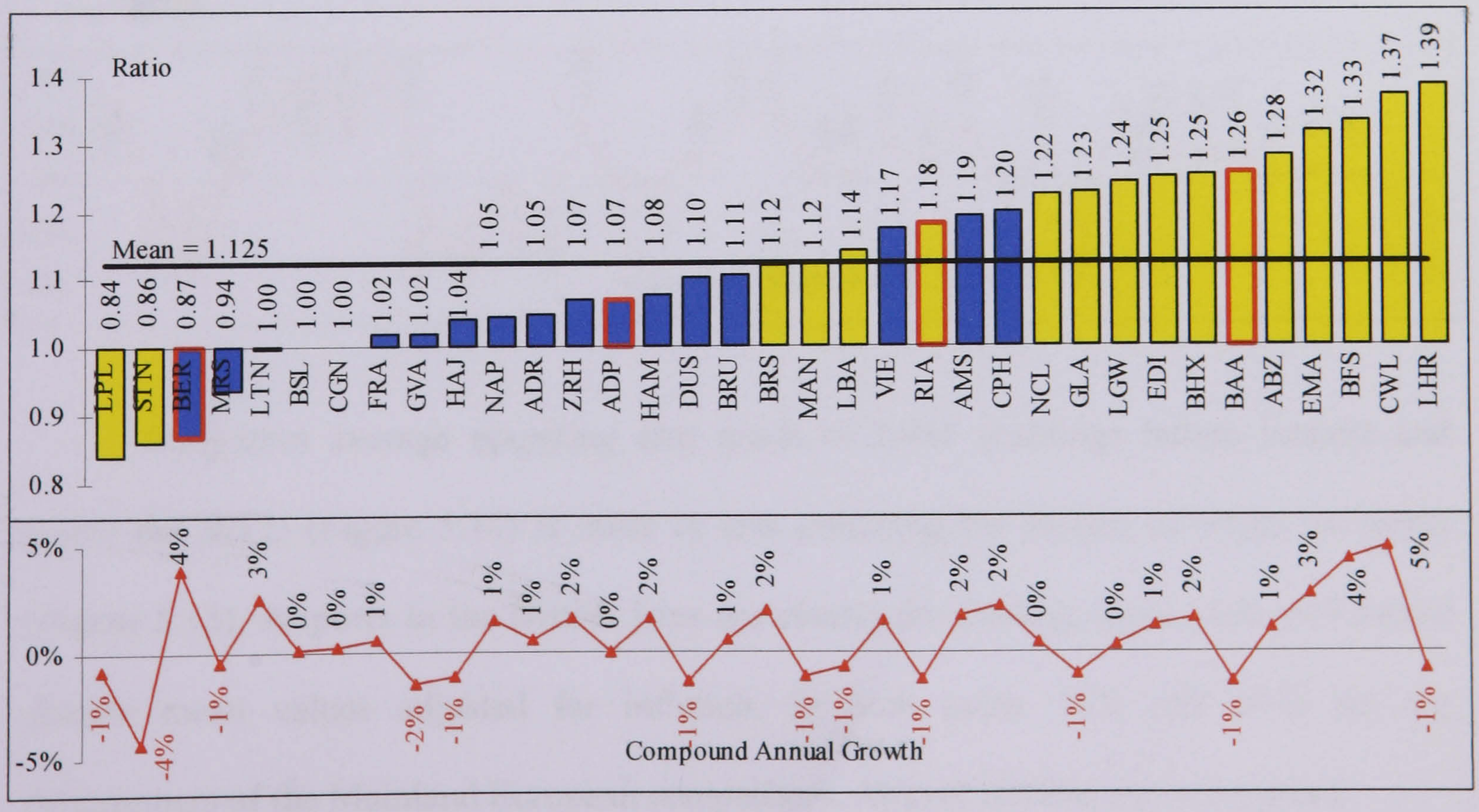

The ten-year growth rates of inflation-adjusted commercial revenue per terminal passenger (Figure 5.11) confirm the structural changes indicated in the discussion of the share of non-aeronautical revenue. Especially the BAA Group stands synonymous for what has been termed the 'retail revolution' in the airport business during the '90s. The spread in commercial revenue per passenger is considerable, indicating some potential for improvement for below par sample airports.

Figure 5.11: Long-term Average of Inflation-Adjusted Commercial Revenue per Terminal Passenger 1990-1999




The revenue/expenditure ratio (RevEx, Figure 5.12) specifies whether or not all costs incurred are covered by revenues generated in the business. This seems to be the case for approximately two thirds of the sample with a ratio greater than one, which is clearly dominated by airports operating in the British Isles.

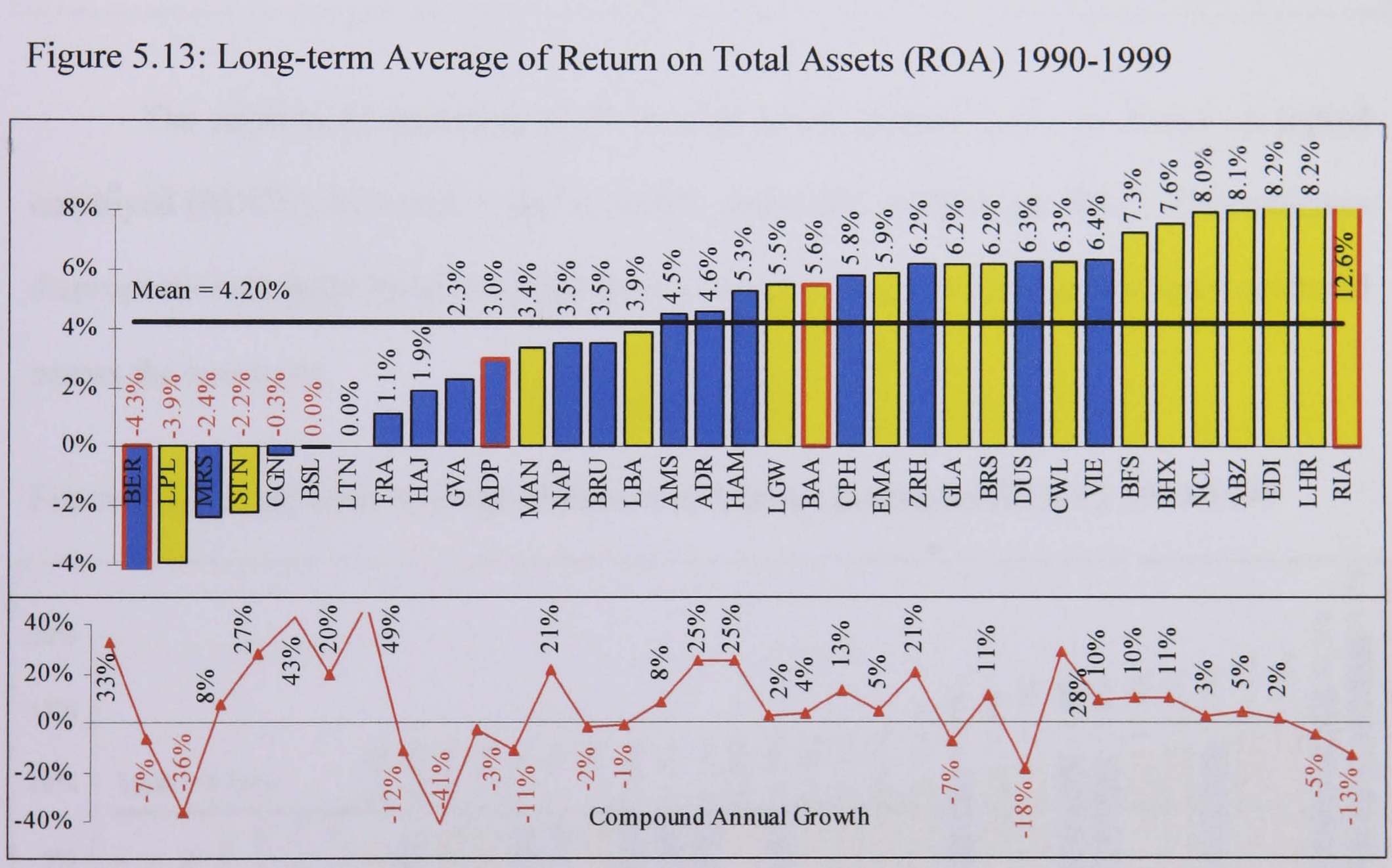
Figure 5.12: Long-term Average of the Revenue / Expenditure Ratio 1990-1999



In principle, the overall RevEx level is indicating comparatively low margins in the airport sector. This is also confirmed by the return rate on assets (ROA, Figure 5.13) and return on capital employed (ROCE, Figure 5.15).

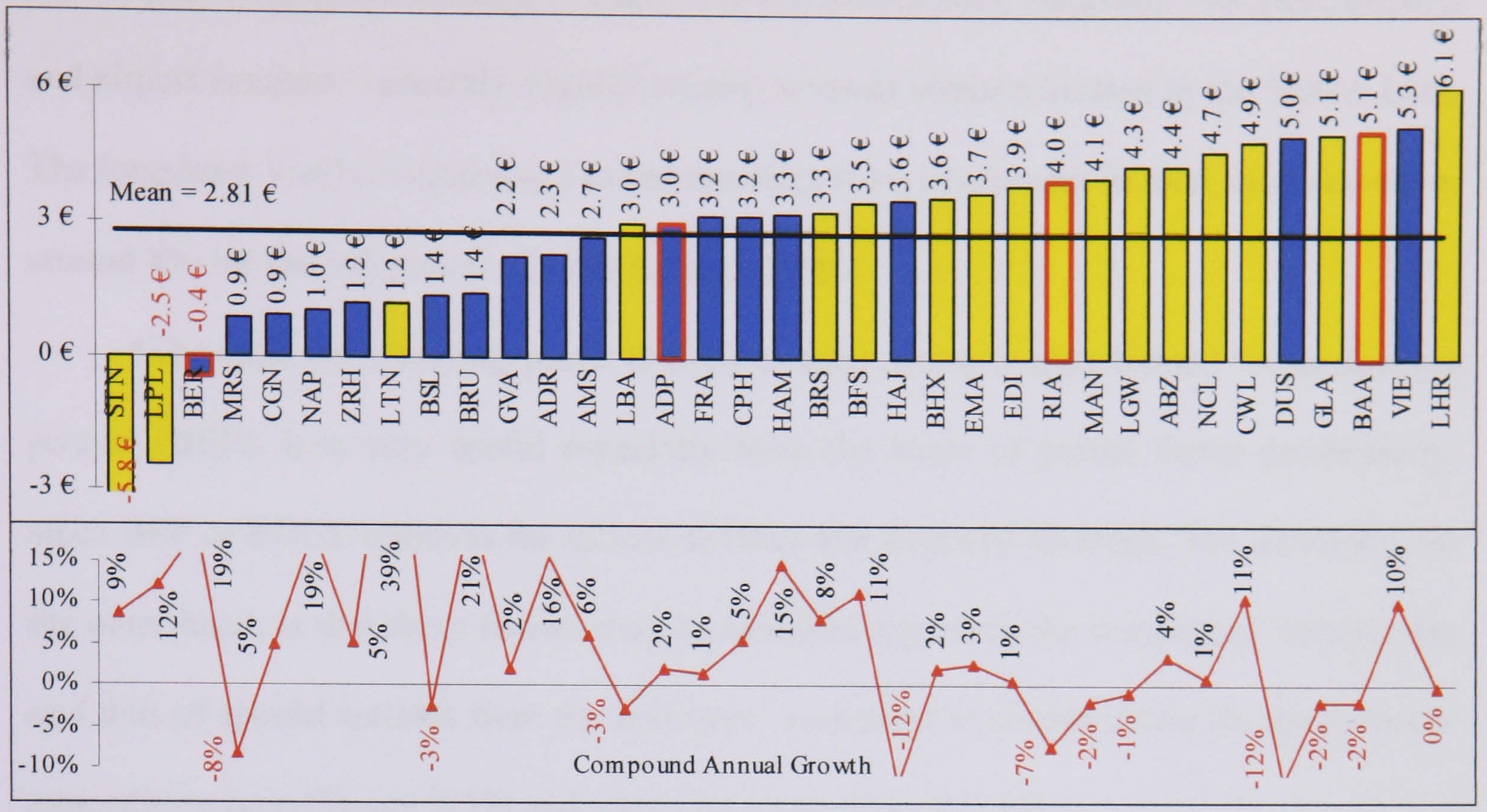
The sample average of the return on assets (Figure 5.13), which is the return generated by the business, is quite low in comparison to other industries. Airports operating in the British Isles, however, appear to be well above this long-term hurdle around only 4%, while several of their Mainland European competitors seem to be picking up considerably in terms of strong compound annual growth rates, though on a low (e.g. FRA) or even negative basis (e.g. BER) in some cases. Those airports which revealed a revenue/expenditure ratio below one also deliver negative returns on total assets.

Figure 5.13: Long-term Average of Return on Total Assets (ROA) 1990-1999



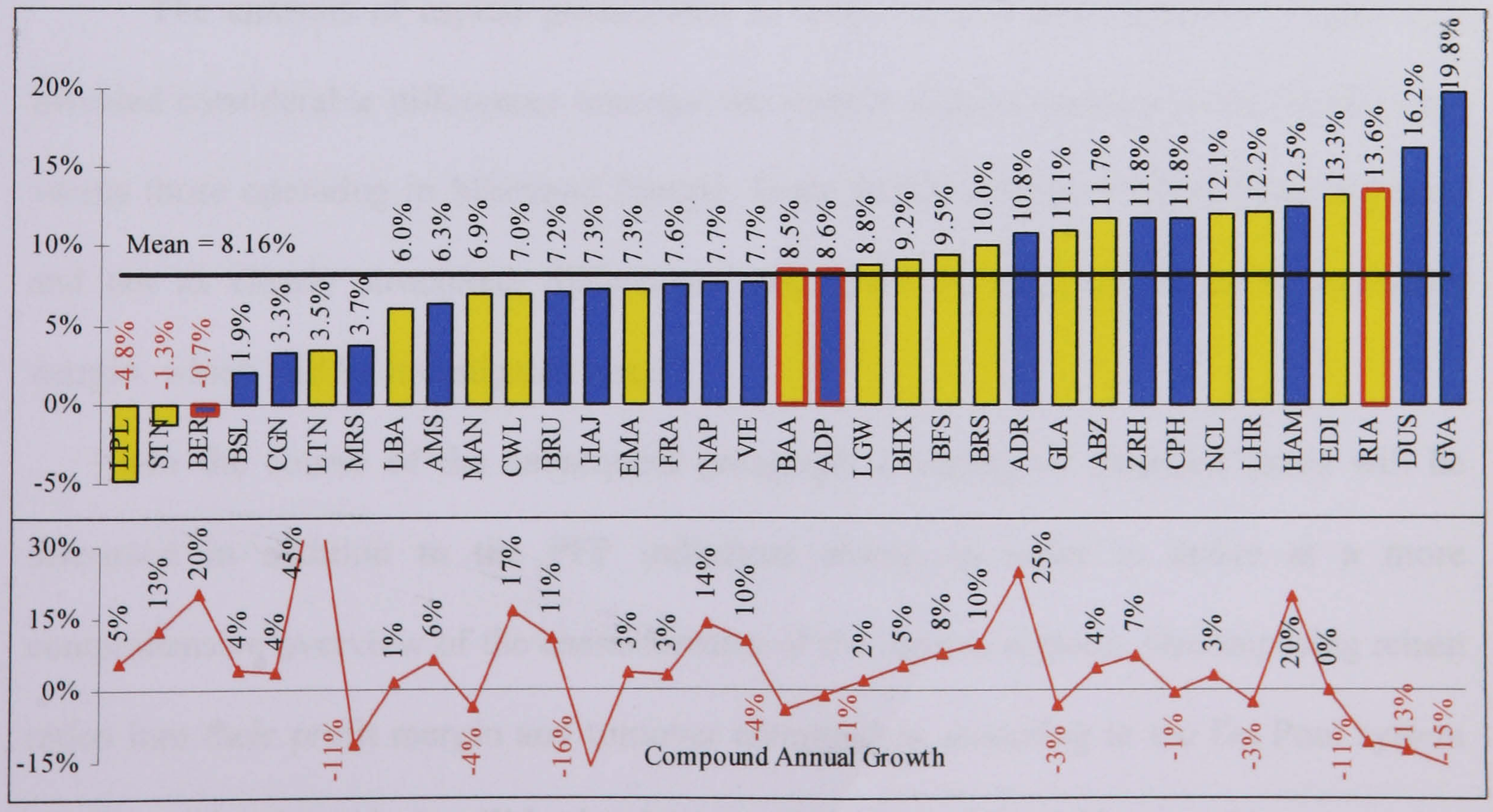

Long-term average operating unit profit or EBIT (earnings before interest and taxes) per WLU (Figure 5.14) is more or less mirroring the picture of return on assets (Figure 5.13). Airports in the British Isles are clearly dominating, again with well-above sample mean values adjusted for inflation. In both cases, VIE and DUS are the frontrunners of the Mainland European competitors. Airport systems are widespread.

Figure 5.14: Long-term Average of Inflation-Adjusted Operating Profit per WLU 1990-1999




The relation of operating profit to total assets (Figure 5.15), or return on capital employed (ROCE), however, is not as clearly structured as EBIT per WLU. This indicates disproportionate asset bases amongst sample airports. Airport systems are again scattered across the spectrum.

Figure 5.15: Long-term Average of Return on Capital Employed (ROCE) 1990-1999



No real common conclusion is imposing itself regarding this ratio. The range of ROCE is as wide as the mixture of airports in the British Isles, Mainland European airports and airport systems – possibly slightly leaning towards airports located in the British Isles. The long-term level of operating income resulting from investment in total assets averages around 8% for the full period of 1990 through 1999.

The ratio of operating profit (EBIT) to total assets is also termed 'basic earning power' (BEP). It is very useful especially from the angle of partial factor productivity, since BEP or ROCE removes the effects of taxes and financial leverage. The downside, on the other hand, is that these factors may be essential regarding the companies' bottom line and thus of special interest from the investors' viewpoint as shown above for the revenue/ expenditure ratio (Figure 5.12) and return on assets (Figure 5.13).

The BEP ratio or return on capital employed can also be broken down into two components, being operating margin and total asset turnover:

$$\frac{\text{Operating Profit}}{\text{Total Assets}} = \frac{\text{EBIT}}{\text{Total Revenue}} \times \frac{\text{Total Revenue}}{\text{Total Assets}}$$

In general, the method of decomposing allows identifying the 'sources' of several performance indicators.

The analysis of capital productivity in terms of total asset turnover (Figure 5.7) revealed considerable differences amongst the sample airports situated in the British Isles versus those operating in Mainland Europe. Since ROCE (Figure 5.15) is more disparate and not as clearly structured, differences may again be expected regarding operating margin, which will be investigated next.

In the course of the subsequent paragraph a variety of financial ratios will be discussed in addition to the PFP indicators above, in order to arrive at a more comprehensive overview of the characteristics of the sample airports. Decomposing return ratios into their profit margin and turnover components according to the Du Pont system via financial ratio analysis will lead to increased insight into the subject matter.

### 5.1.2 Financial Ratios

As elaborated on earlier, different users of financial ratio analysis may attach different degrees of importance to the individual categories. To the potential investor or security analyst, the critical consideration is profitability and market value, with a secondary consideration given to such matters as liquidity and debt utilization. For the banker or trade creditor, the emphasis shifts to the company's current ability to meet debt obligations. The bond holder, in turn, may be primarily influenced by debt to total assets, while also eyeing profitability in terms of the ability to cover debt obligations.

In the context of this analysis a variety of ratios were calculated as per Appendix B.4, Results of FRA. Those ratios which have already been included in the analysis of PFP but could also be subsumed under financial ratios are not repeated here. Table 5.2 summarizes the respective definitions, in which EBITDA stands for earnings before interest, taxes, depreciation and amortization and EBT for earnings before taxes.

Table 5.2: Definitions of Financial Ratios and Indicators

| **Performance Indicator** | **Definition** |
|---|---|
| **Group 1: Profitability** | |
| Operating Margin, Profit Margin | EBIT divided by Total Revenue |
| EBITDA Margin | EBITDA divided by Total Revenue |
| Return on Net Assets (RONA b.I.a.T.) | EBIT divided by Net Assets |
| EBITDA per WLU | EBITDA divided by WLUs |
| Inflation Adjusted EBITDA per WLU | EBITDA per WLU indexed to 1995 |
| Return on Total Revenue (Return on Sales, ROS) | Net Income divided by Total Revenue |
| Return on Shareh. Funds (Return on Equity, ROE) | Net Income divided by Shareholders' Funds |
| **Group 2: Debt and Asset Management** | |
| Debt Ratio | Total Debt divided by Total Assets |
| Gearing (Debt/Equity Ratio) | Total Debt divided by Shareholders' Funds |
| Fixed Asset Turnover | Total Revenue divided by Fixed Assets |
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets divided by Total Assets |
| Financial Leverage | Total Assets divided by Shareholders' Funds |
| **Group 3: P&L Accounts & Indicators** | |
| Cash Flow | Net Income + Depreciation |
| Cash Flow per WLU | Cash Flow divided by WLUs |
| Cash Flow in Percent of Total Revenue | Cash Flow divided by Total Revenue |
| Investment Coverage Ratio | Cash Flow divided by Capital Expenditure |
| Tax Rate | Taxes Paid divided by EBT |

Table 5.2: Definitions of Financial Ratios and Indicators (cont'd)

| **Performance Indicator** | **Definition** |
|---|---|
| **Group 3: P&L Accounts & Indicators (cont'd)** | |
| Total Rev. per Currency Unit of Shareh. Funds | Total Revenue divided by Shareholders' Funds |
| Owner Earnings | Net Income + Depreciation – Investment |
| Capital Expenditure per Terminal Passenger | Investment divided by Terminal Passengers |
| Infl. Adj. Capital Expenditure per Terminal PAX | Investment div. by Terminal PAX indexed to '95 |
| Capital Expenditure in Percent of Total Revenue | Investment divided by Total Revenue |
| Capital Expenditure to Depreciation Ratio | Investment divided by Depreciation Cost |

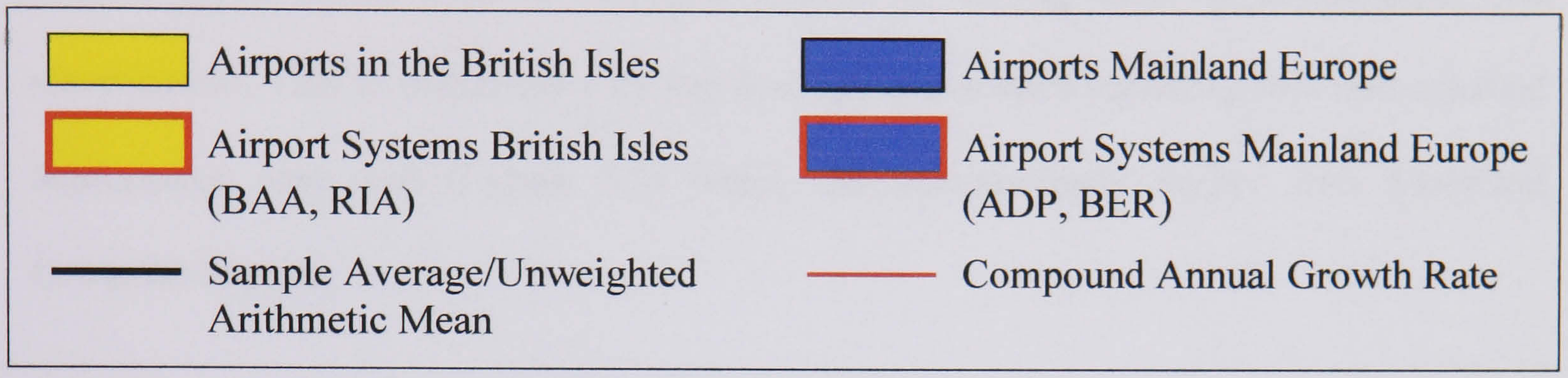
The subsequent Figures 5.16 through 5.33 illustrate a selection of the various financial ratios calculated and tabulated in Appendix B.4. While bars are reflecting the ten-year average (arithmetic mean) for the individual airport or airport system, the red line and percentages given in the lower portion of the graphs reflect the corresponding compound annual growth rate (CAGR) for the full period from the base year 1990 through 1999 and 1990/1991 through 1999/2000, respectively, for those cases where the reporting period is the fiscal year ending 31 March. The total sample average calculated as the unweighted arithmetic mean of all observations of the sample airports is displayed by the horizontal solid line. The BAA Group, however, is excluded from the calculation of sample means in order to avoid double counting.

While monetary data for 1999 is in Euro for Euroland countries/airports, all other data was converted from local currency to ECUs for 1990-1998 and to Euro for 1999, respectively, at the prevailing exchange rates as per Datastream®. Where monetary terms are adjusted for inflation, all data is indexed to the common base year 1995 = 100 and converted into real terms according to Datastream®/OECD price inflation indices. Where the reporting period is for the fiscal year ending 31 March, foreign exchange rates and inflators are the blended average of Quarters II-IV of the fiscal year beginning 1 April and Quarter I of the subsequent calendar year.

Bars representing airports located in the British Isles are yellow, those of airports scattered across Mainland Europe come in blue colour. As already discussed in the section

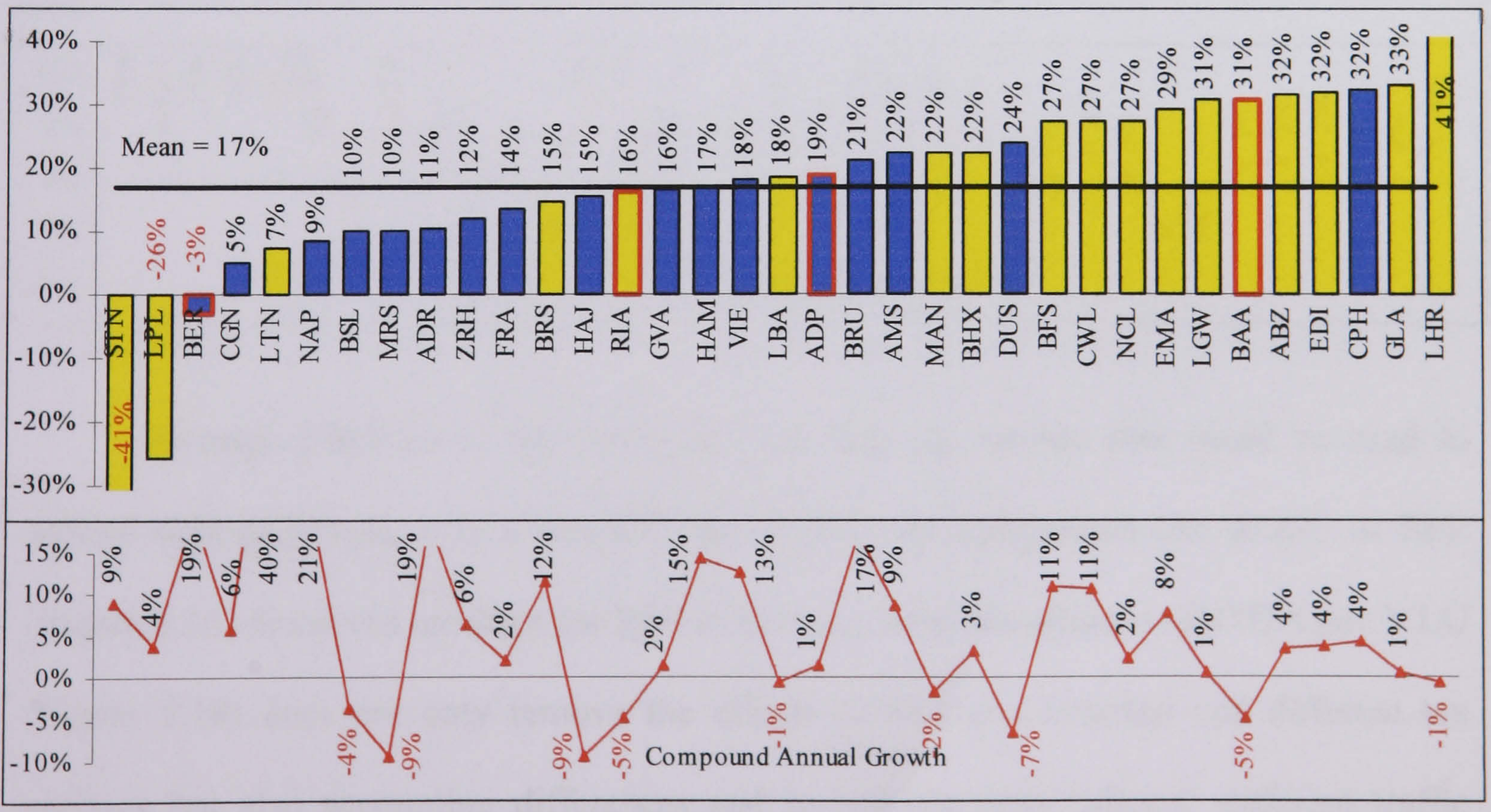
on subjects and instruments and illustrated by Table 4.2 on the ownership structure of sample airports, these groups at the same time stand for a high degree of airports in mixed or fully private ownership versus a majority of publicly owned ones in terms of the respective numbers of fiscal years under fully private, mixed, or public ownership. Bars of airport systems carry bold red borders.

Key to Figures on Financial Ratios




The wide spread of the long-term operating margins (Figure 5.16) reveals negative extremes for STN and LPL and highs for GLA and LHR, all located in the British Isles. This group also makes up for the vast majority of above-average values, while Mainland European airports – except CPH and DUS – range around or below the sample mean.

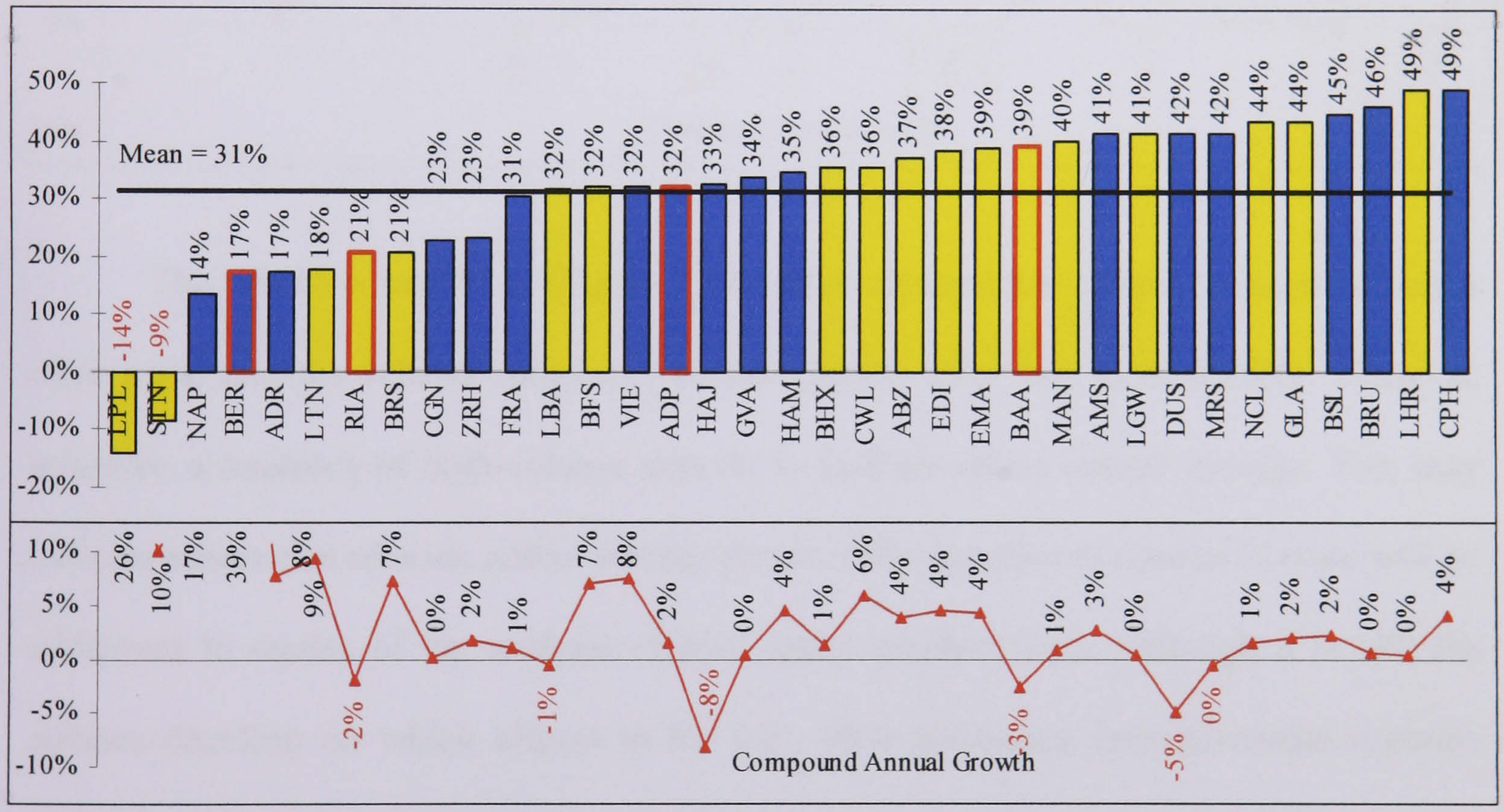
Figure 5.16: Long-term Average of Operating Margin 1990-1999



By nature, this picture of average operating margins is closely related to the revenue/expenditure ratio (Figure 5.12) discussed amongst PFP indicators. The spread of the compound annual growth rates is as wide as the spread of actual margins. Regardless of geographical location, most sample airports reveal positive to high growth rates, while a few others record deteriorating margins in terms of negative growth.

In comparison to the EBIT or operating margin (Figure 5.16), the EBITDA margin (Figure 5.17) shows a more balanced picture by adding back in depreciation and amortization. This is consistent with the descriptive statistics regarding inflation-adjusted depreciation unit cost (Figure 5.3) which are comparatively higher with Mainland European airports.

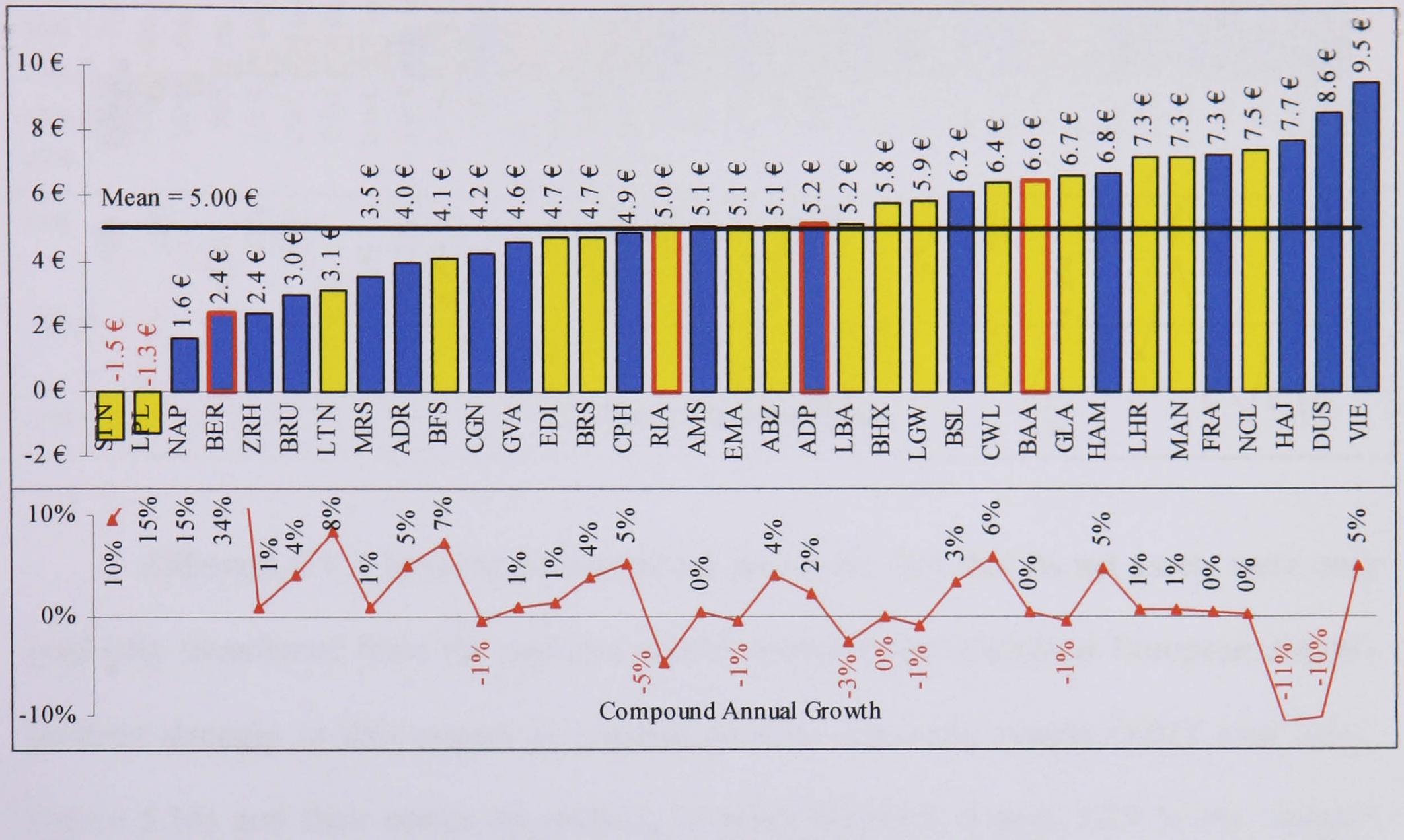
Figure 5.17: Long-term Average of EBITDA Margin 1990-1999




Average EBITDA is the operating cash flow or income that could be used to service debt payments. It is a similarly useful ratio for comparison like ROCE or BEP (Figure 5.15) discussed amongst the PFP indicators. Inflation-adjusted EBITDA per WLU (Figure 5.18) does not only remove the effects of financial leverage and different tax regimes but also accounting differences and in addition also 'adjusts' different traffic

volumes. The downside is again that those factors may be essential regarding the companies' ultimate financial performance in the marketplace and thus of special interest from the investors' perspective.

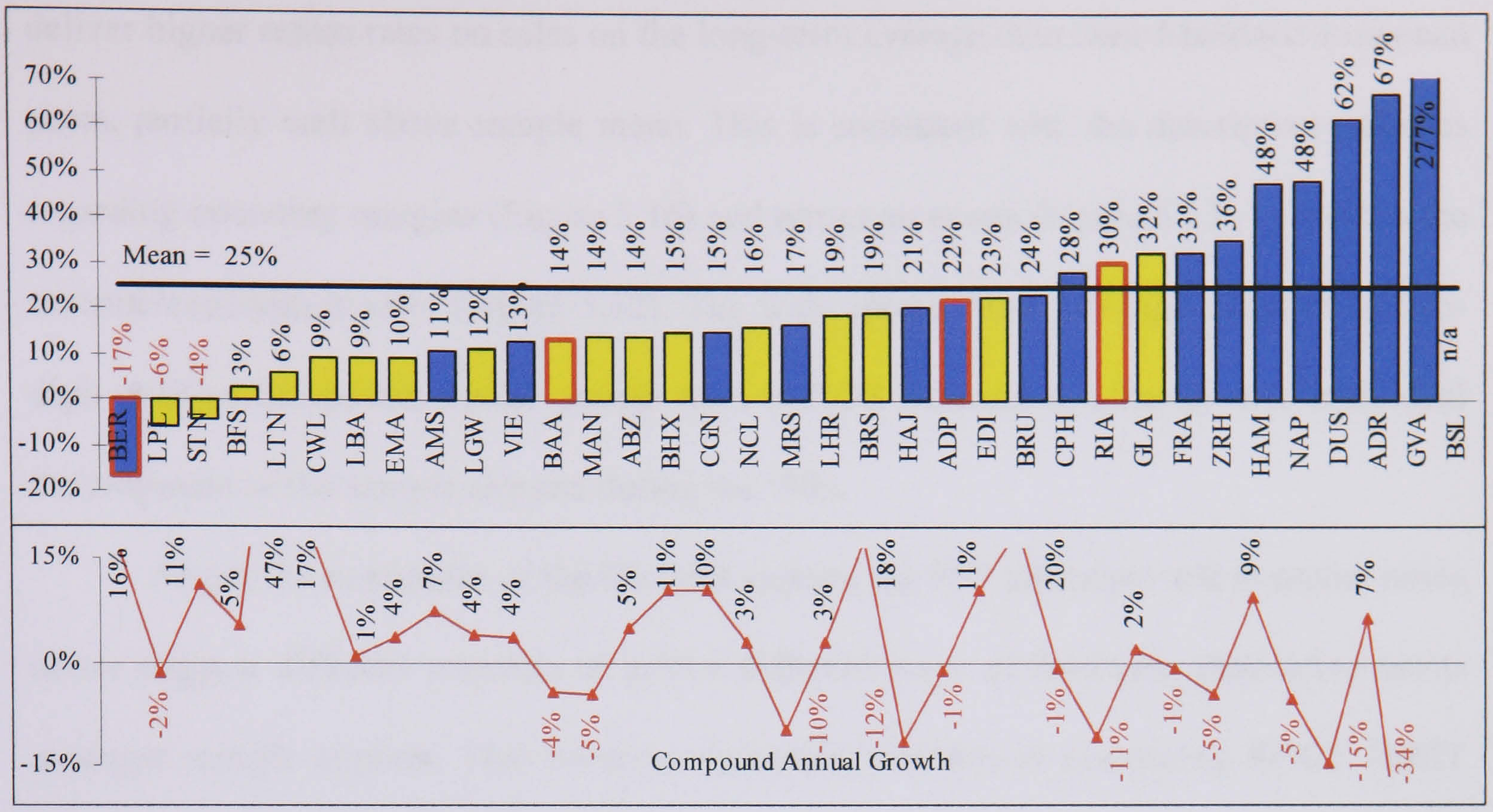
Figure 5.18: Long-term Average of Inflation-Adjusted EBITDA per WLU 1990-1999




The EBITDA per WLU (Figure 5.18) index adjusted for inflation does not reveal a clear trend and the related compound annual growth rates vary considerably. There is, however, a tendency of high-volume airports to perform above sample average. This may indicate economies of scale and/or market power. (The question of returns to scale will be addressed in course of the analysis of total factor productivity). Although it is still the airlines deciding on which airport to fly into, their prevailing hub-and-spoke systems, including alliance partners, tended to be biased towards the majors during the '90s.

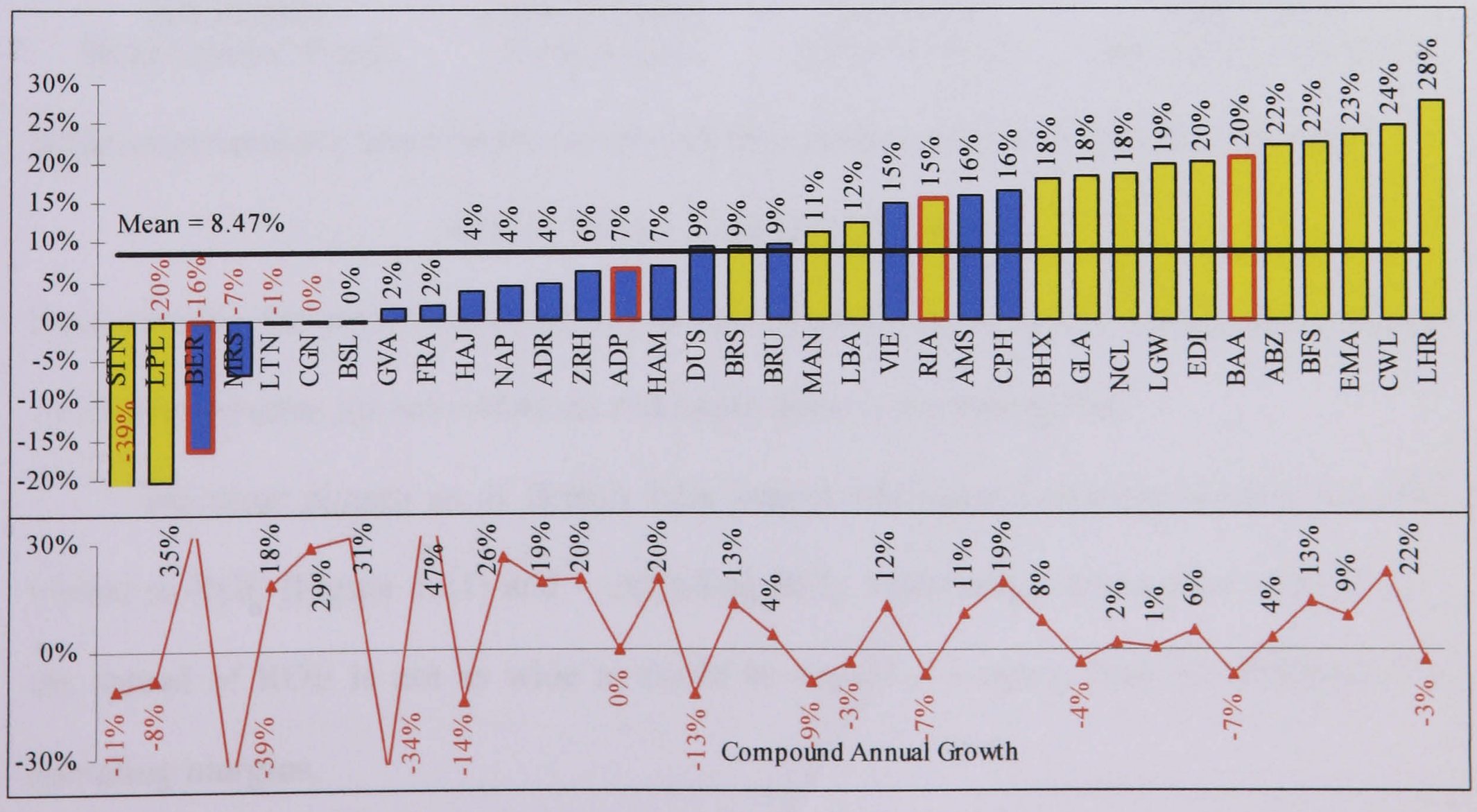
The return rate on net assets before interest and taxes or EBIT over shareholders' funds (Figure 5.19), however, is a considerably different scenery, which indicates different volumes of net assets and implicitly of total assets bases and hence different capital structures. It needs to be noted that this ratio is not calculable for BSL, since it does not record any equity on its balance sheet due to its specific legal status.

Figure 5.19: Long-term Average of Return on Net Assets (RONA b.I.a.T.) 1990-1999




Although GVA tends to be overstated due to the fact that its net assets were only gradually transferred from the regional administrative body, Mainland European airports perform strongly in this respect as opposed to their operating margin (EBIT over sales, Figure 5.16) and their return on revenue or sales (ROS) in Figure 5.20 below. Airport systems do not appear to expose a specific pattern regarding the return rate on net assets.

Figure 5.20: Long-term Average of Return on Total Revenue (ROS) 1990-1999



Airports in the British Isles, including the two respective airport systems, clearly deliver higher return rates on sales on the long-term average than their Mainland European peers, partially well above sample mean. This is consistent with the descriptive statistics regarding operating margins (Figure 5.16) and return on assets (Figure 5.13), as well as the revenue/expenditure ratio (Figure 5.12). The wide spread from two-digit negative to two-digit positive compound annual growth rates in ROS indicates a rather diverse individual development of the sample airports during the '90s.

As per the mechanics of the Du Pont system, the PFP indicators and financial ratios above suggest different amounts of and/or different ways of financing productive assets amongst sample airports. This becomes especially obvious in comparing ROCE (EBIT over total assets, Figure 5.15) as opposed to RONA b.I.a.T. (EBIT over net assets or equity, Figure 5.19), against the background of higher asset turnover and RONA versus lower ROA (Figure 5.13) of Mainland European airports and vice versa.

The different capital structure of sample airports is also implicitly reconfirmed by the return rates on shareholders' equity below (Figure 5.21). According to the extended Du Pont equation, ROE can be spit into three components, being turnover of total assets, return on sales and financial leverage:

$$\frac{\text{Net Income}}{\text{Shareholders' Funds}} = \frac{\text{Total Revenue}}{\text{Total Assets}} \times \frac{\text{Net Income}}{\text{Total Revenue}} \times \frac{\text{Total Assets}}{\text{Shareholders' Funds}}$$

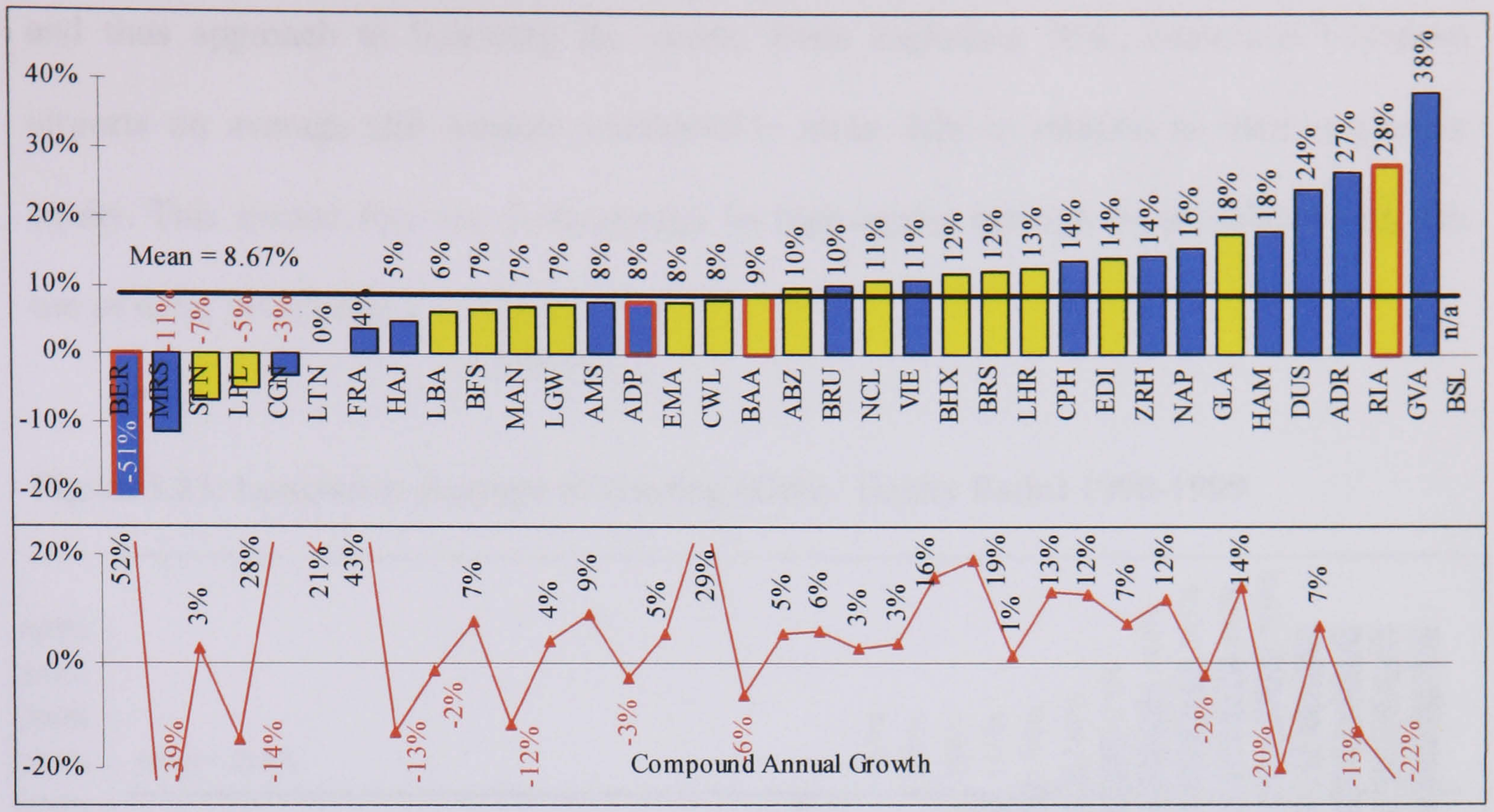
while asset turnover times return on sales (ROS) equals return on assets (ROA), hence

$$\text{ROE} = \text{ROA} \times \text{Financial Leverage.}$$

Decomposing the return ratios of the sample airports in the profit margin and turnover constituents makes the interrelations and implications very transparent.

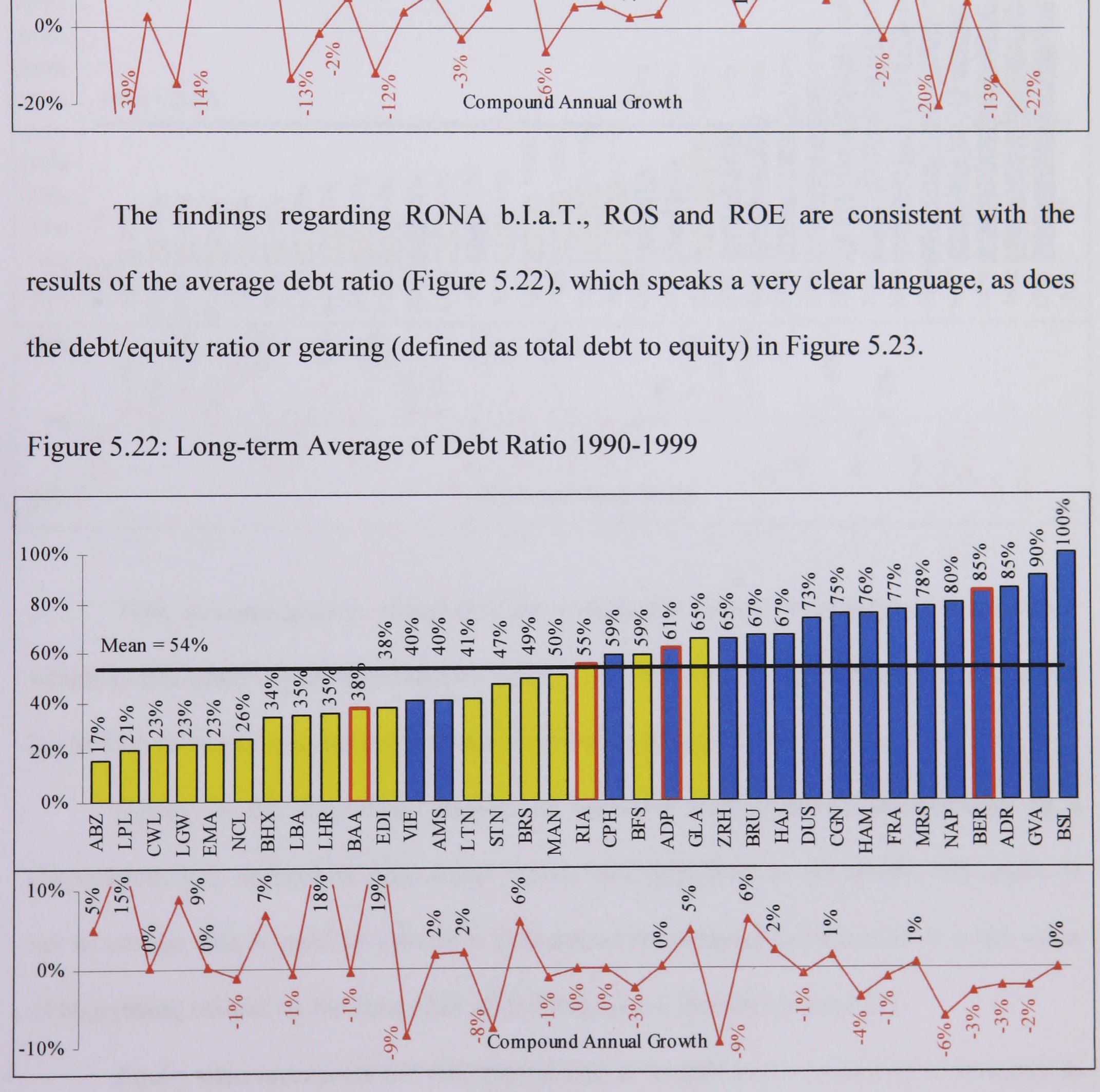
No clear pattern as to British Isles versus Mainland European airports becomes visible in ROE (Figure 5.21) and – excluding BSL, where total debt equals total assets – the spread of ROE is not as wide as could be expected judging from the differences in operating margins.

Figure 5.21: Long-term Average of Return on Shareholders' Funds (ROE) 1990-1999




The findings regarding RONA b.I.a.T., ROS and ROE are consistent with the results of the average debt ratio (Figure 5.22), which speaks a very clear language, as does the debt/equity ratio or gearing (defined as total debt to equity) in Figure 5.23.

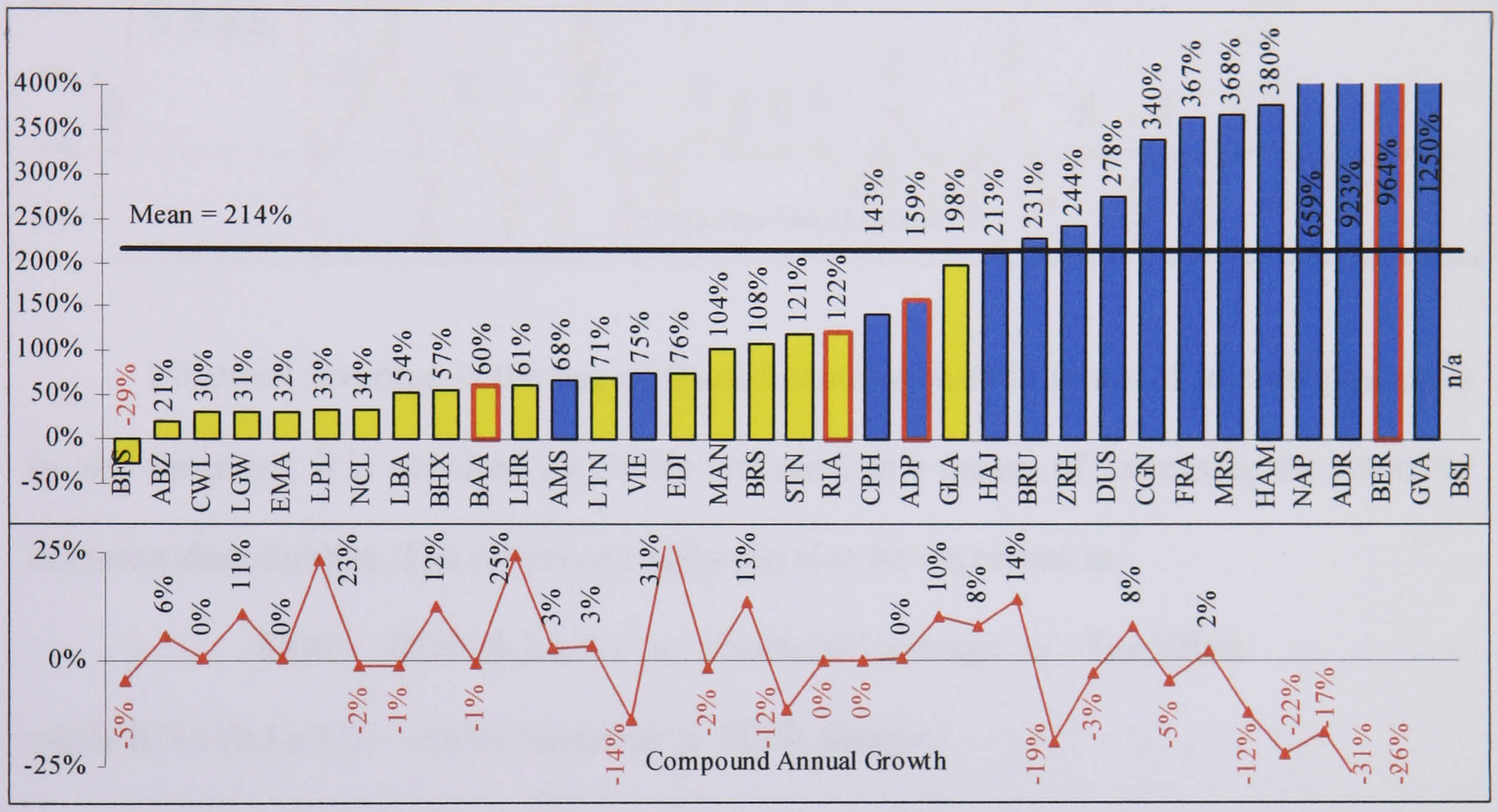
Figure 5.22: Long-term Average of Debt Ratio 1990-1999




Neither Figure 5.21 nor 5.22 reveal any distinct pattern regarding airport systems.

Both total indebtedness and gearing give evidence of a different capital structure and thus approach to financing the assets. Even excluding BSL, Mainland European airports on average still assume considerably more debt in relation to their respective equity. This means, they are characterized by high equity multipliers associated with the use of debt, which equal $1 + \frac{\text{Debt}}{\text{Equity}}$.

Figure 5.23: Long-term Average of Gearing (Debt / Equity Ratio) 1990-1999

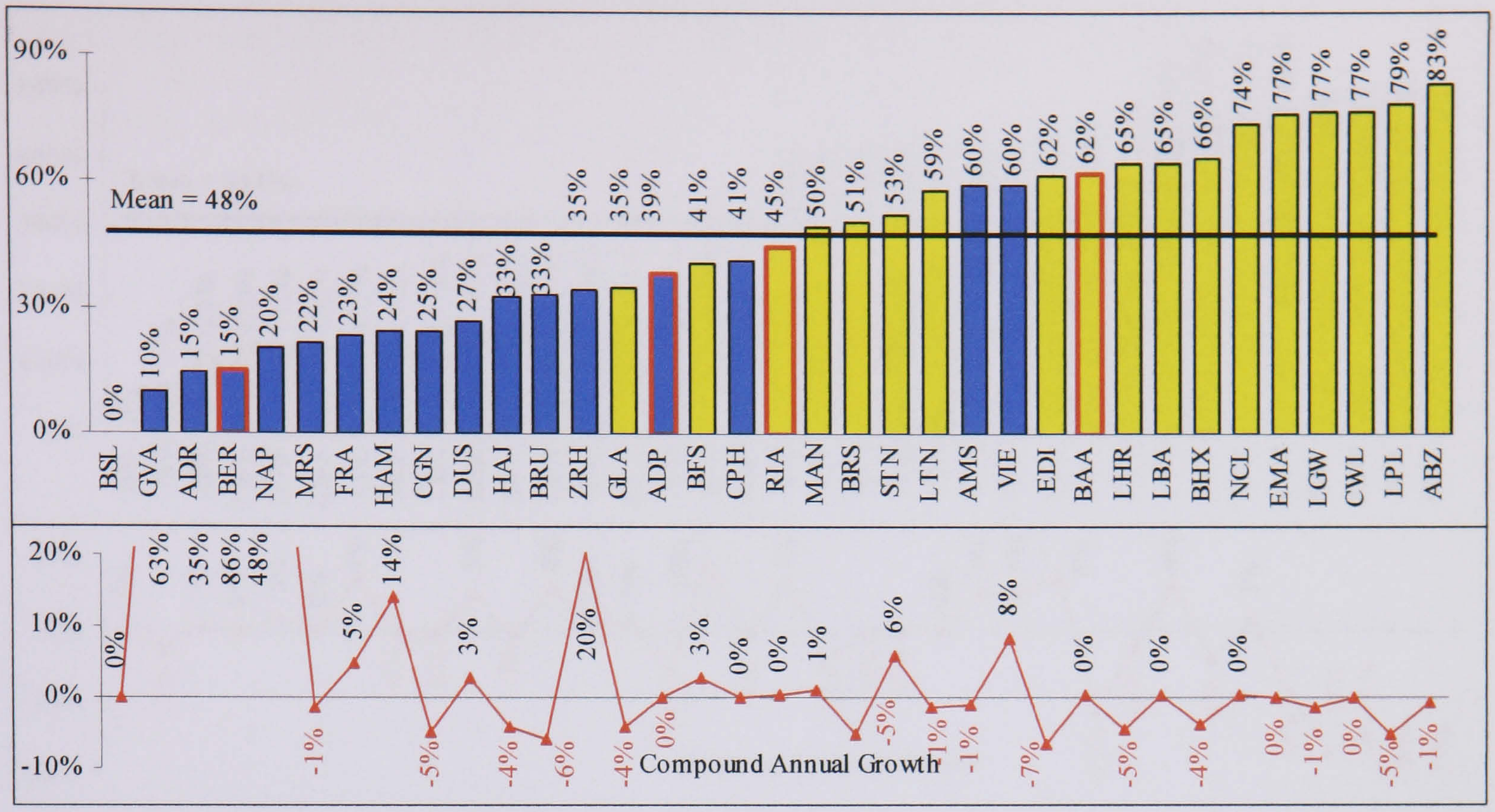



This, in consequence, translates into a markedly higher percentage of net assets – which in this study equal shareholders' funds – to total assets (Figure 5.24) for airports in the British Isles and vice versa for financial leverage (Figure 5.25).

Equity is the ownership interest of common and preferred stockholders in a corporation. It is defined as total assets minus total liabilities, or net worth. Net assets or net worth can also be used as indicative measure of the value of the business. It is the value of everything owned by the firm after all the debts have been accounted for.

Equity also represents the risk capital that is invested in a project or a company to produce the best returns and can be reinvested elsewhere as soon as more profitable opportunities arise.

Figure 5.24: Long-term Average of Net Assets in Percent of Total Assets 1990-1999




Financial leverage is the use of fixed financing costs in terms of interest payments by the company; it is acquired by choice and used as a means of increasing the return to common shareholders. The return on equity can also be expressed as

ROE= ROA (b.I.a.T.) x Financial Leverage x Tax Effect

while ROA (b.I.a.T.) = Asset Turnover x Profit Margin.

Mainland European airports appear to be comparatively highly levered (Figure 5.25). Financial leverage can be broken down into two components, being the income statement (P&L) and the balance sheet effect:

$$\frac{\text{Total Assets}}{\text{Shareholders' Funds}} = \frac{\text{EBIT – Interest Expense}}{\text{EBIT}} \times \frac{\text{Debt + Shareholders' Funds}}{\text{Shareholders' Funds}}$$

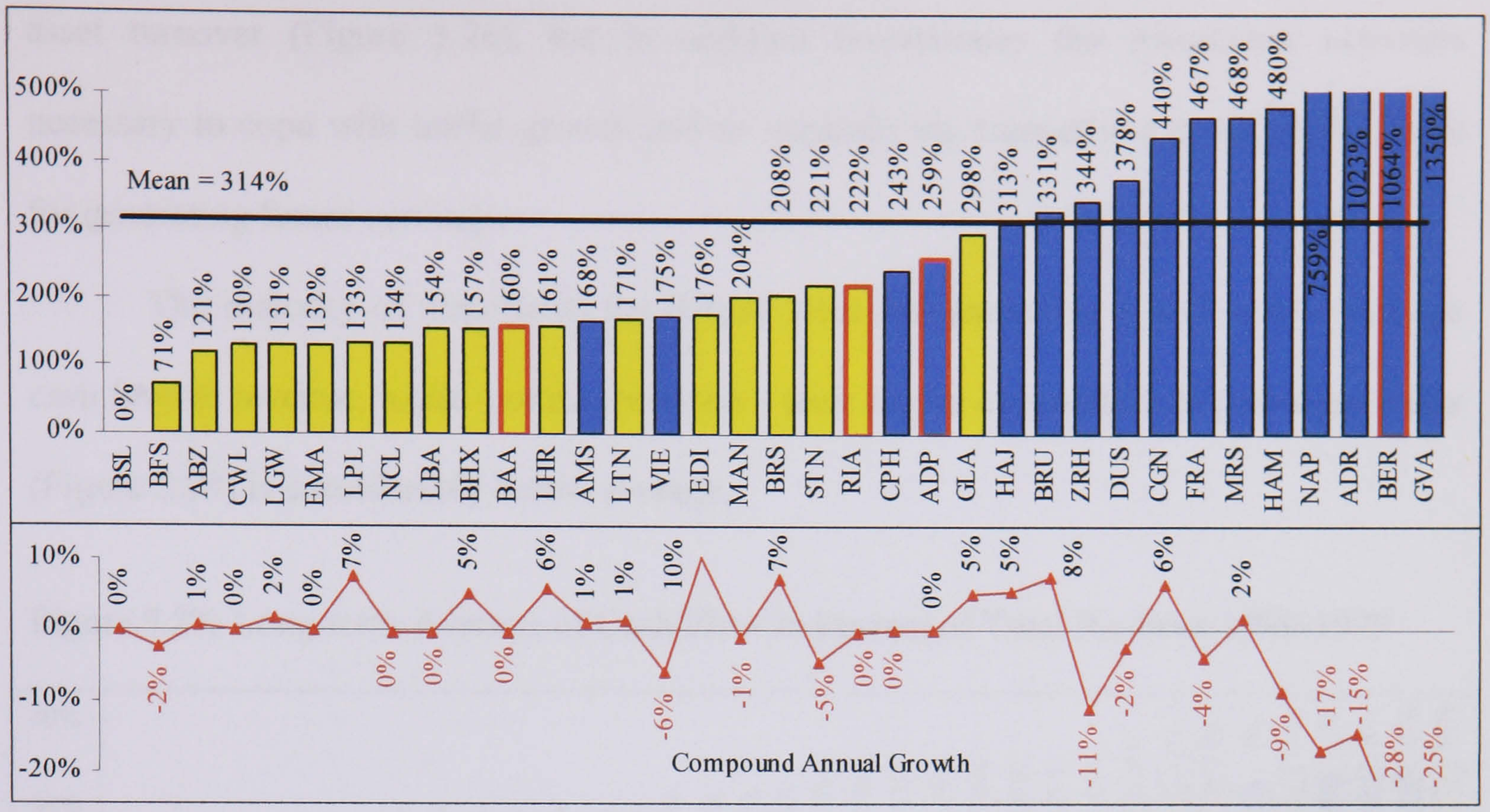
while ROE = Profit Margin x Asset Turnover x Financial Leverage x Tax Effect

or

$$\frac{\text{EBIT}}{\text{Total Rev.}} \times \frac{\text{Total Rev.}}{\text{Total Assets}} \times \frac{\text{EBIT - Interest Expense}}{\text{EBIT}} \times \frac{\text{Debt + Shareh. Funds}}{\text{Shareholders' Funds}} \times \left(1 - \frac{\text{Taxes Paid}}{\text{EBT}}\right)$$

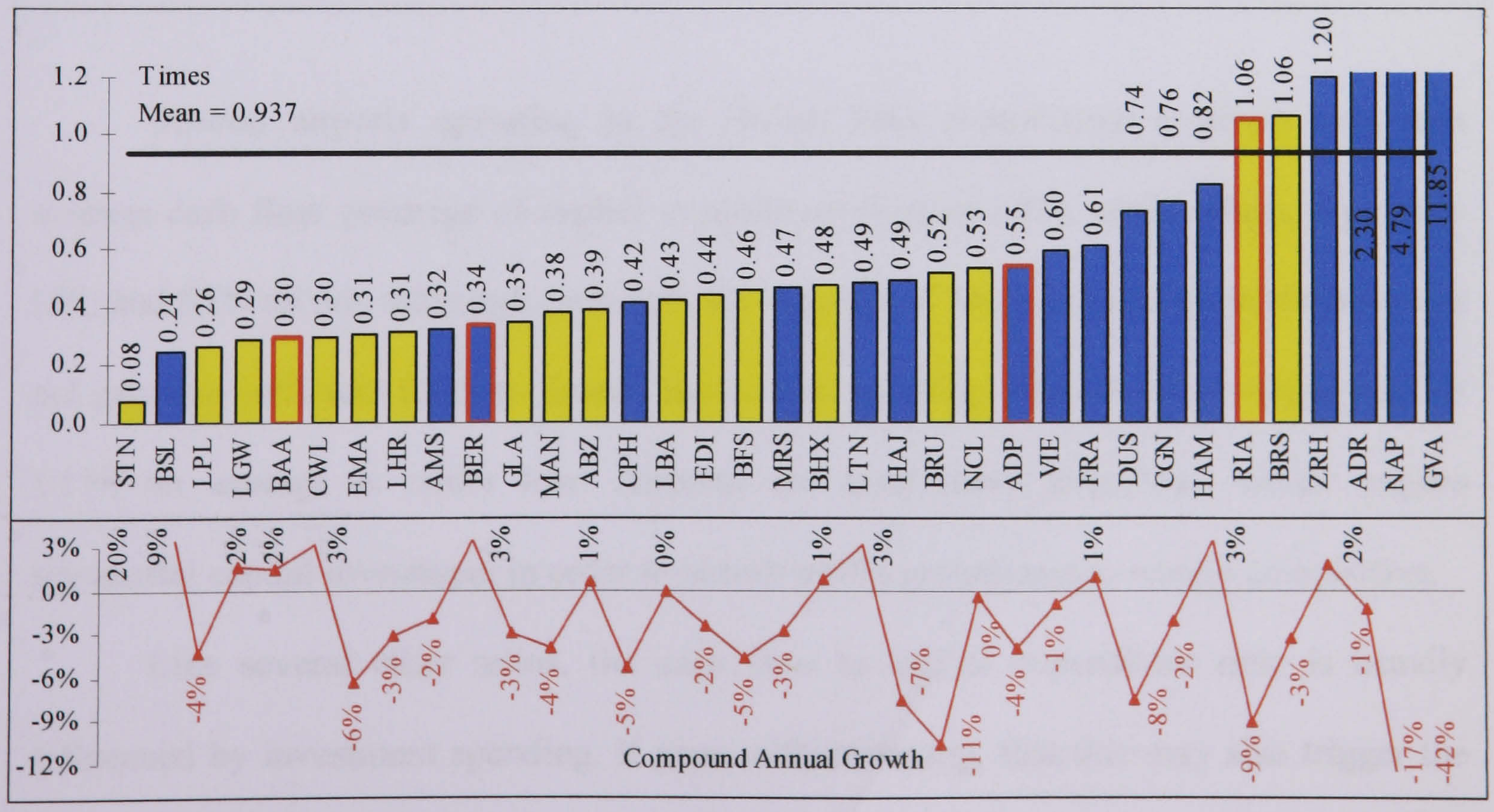
$$= \frac{\text{Net Income}}{\text{Shareholders' Funds}} = \text{ROE} \quad \text{or, in short,} \quad \text{ROE} = \text{ROA} \times 1 + \frac{\text{Debt}}{\text{Equity}}.$$

Figure 5.25: Long-term Average of Financial Leverage 1990-1999




Mainland European airports are dominating with regard to the turnover of fixed assets (Figure 5.26) similar to total asset turnover (Figure 5.7). The spread between sample airports in the British Isles and airports located in Mainland Europe, however, is slightly increasing. This, in turn, implies a comparatively high share of current assets, whereas airports in the British Isles appear to be almost exclusively invested in fixed assets.

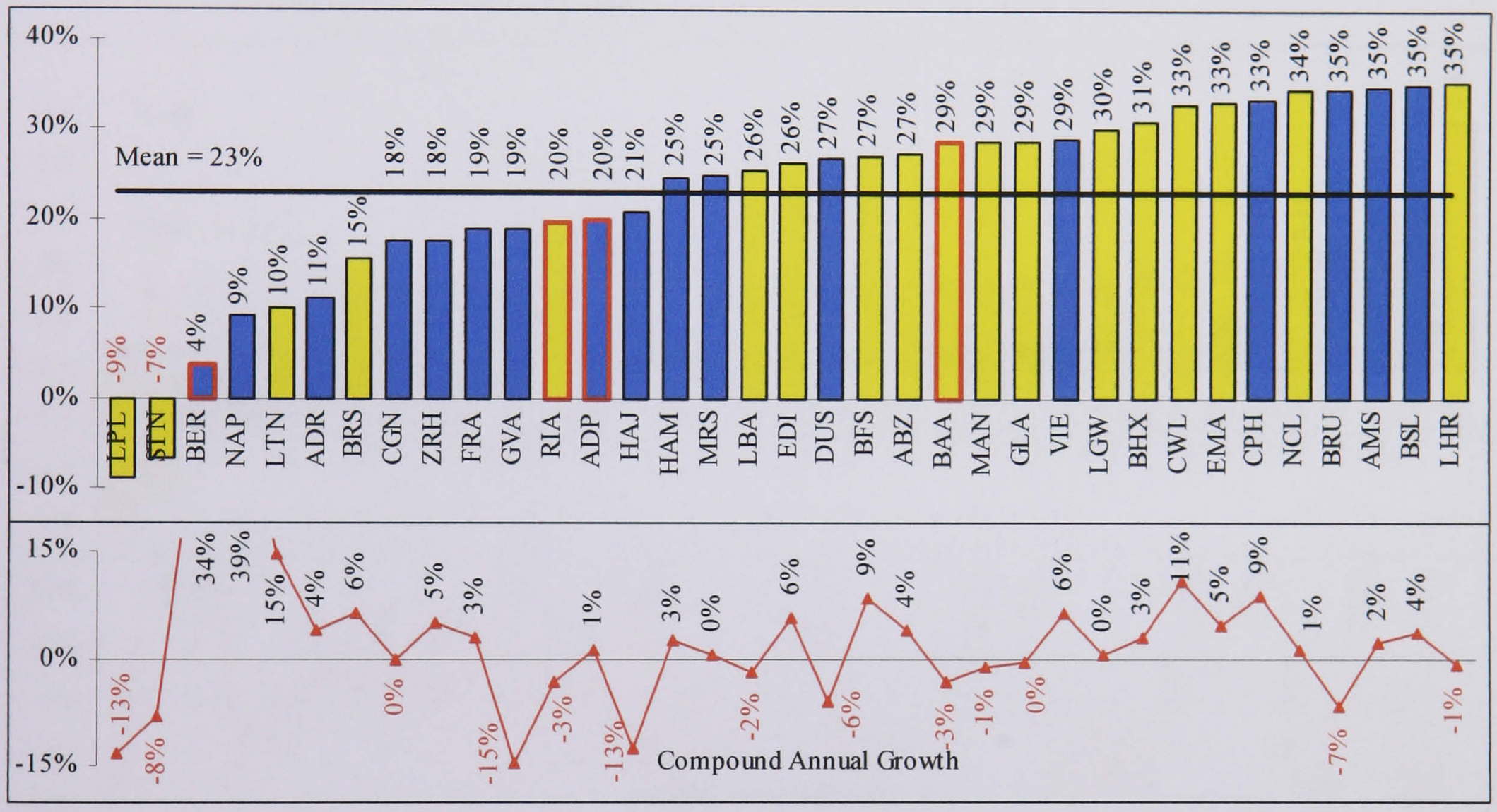
Figure 5.26: Long-term Average of Fixed Asset Turnover 1990-1999



Cash flow as percentage of total revenue (Figure 5.27) is indirectly related to fixed asset turnover (Figure 5.26), but in addition incorporates the investment activities necessary to cope with traffic growth and to maintain the competitive position as a basis for generating future earnings.

The majority of airports in the British Isles are generating a well above average cash flow to revenue, while – or maybe since – their capital expenditure to passenger index (Figure 5.29) is considerably below average.

Figure 5.27: Long-term Average of Cash Flow in Percent of Total Revenue 1990-1999

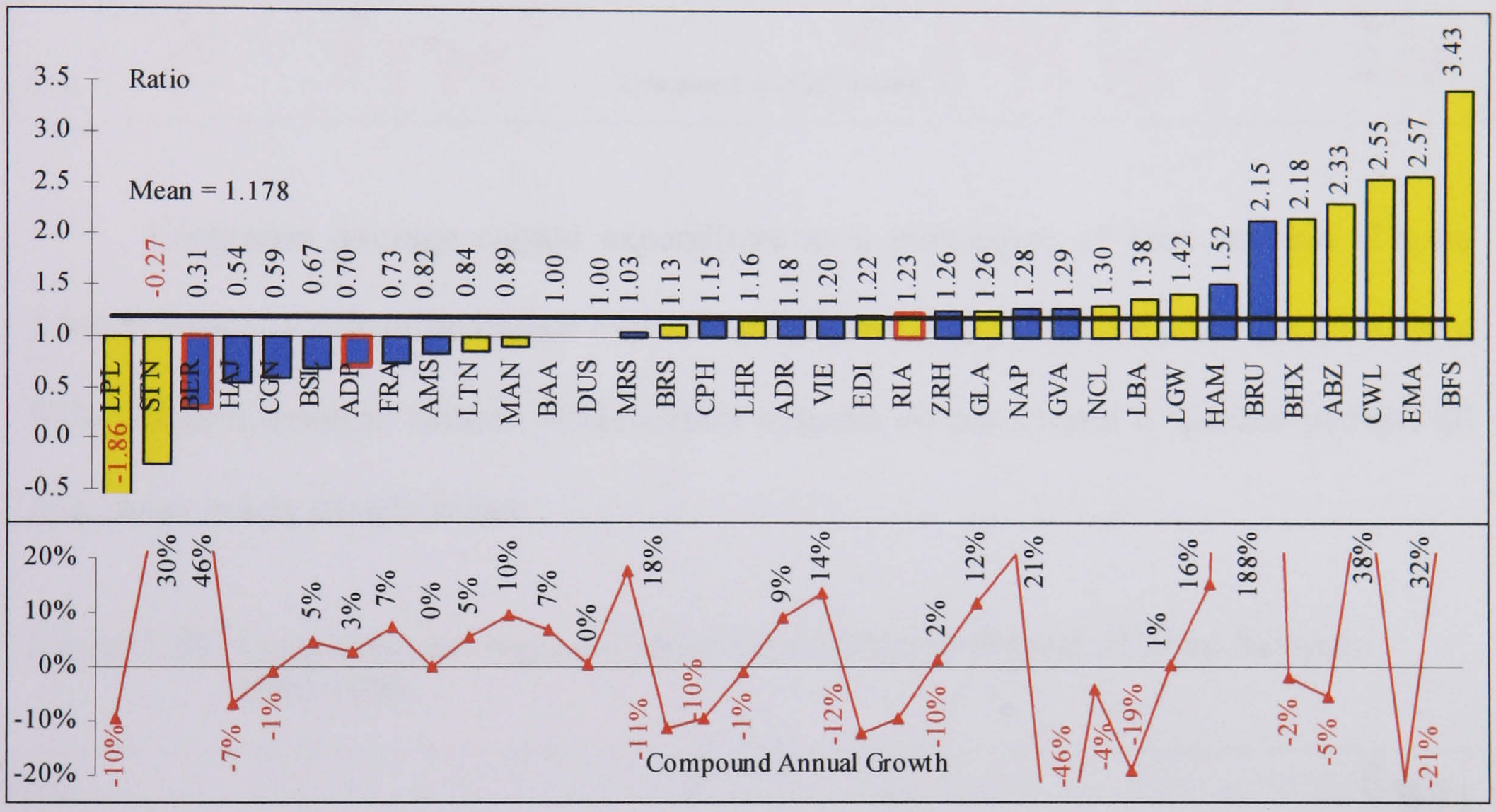



Several airports operating in the British Isles demonstrate a strong long-term average cash flow coverage of capital expenditure (Figure 5.28), while others, especially LPL and STN do not. Although cash-rich, the majority of Mainland European airports does not generate sufficient funds to finance investment spending. The overall coverage ratio of 1.178 on average is rather low. Airports are asset-heavy businesses which require substantial capital investment in order to absorb traffic growth and to remain competitive.

Like several other ratios, the cash flow to capital expenditure ratio is heavily influenced by investment spending. It goes without saying, that this may also trigger the

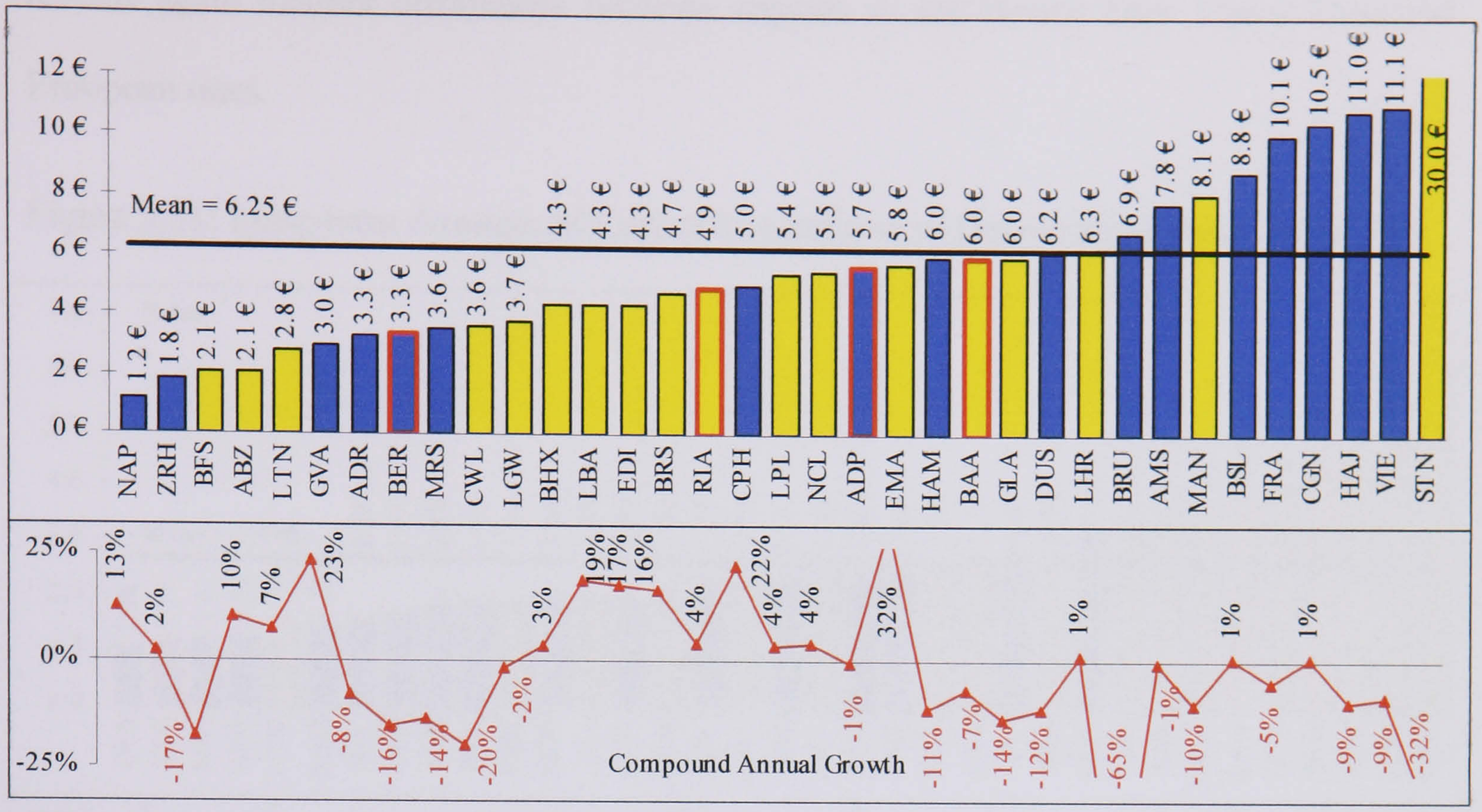
question of quality and service standards under IATA and/or regulatory rules and regulations, as applicable. Furthermore, investment activities may also be an obligation under the respective privatisation/concession agreements. This, and of course normal traffic expansion programmes, may be the reason for – partially substantial – compound annual growth rates, again, especially regarding several airports situated in the British Isles, while some others decrease in real terms. This latter comment also applies to Mainland European airports.

Figure 5.28: Long-term Average of Investment Coverage Ratio (Cash Flow / Capital Expenditure) 1990-1999



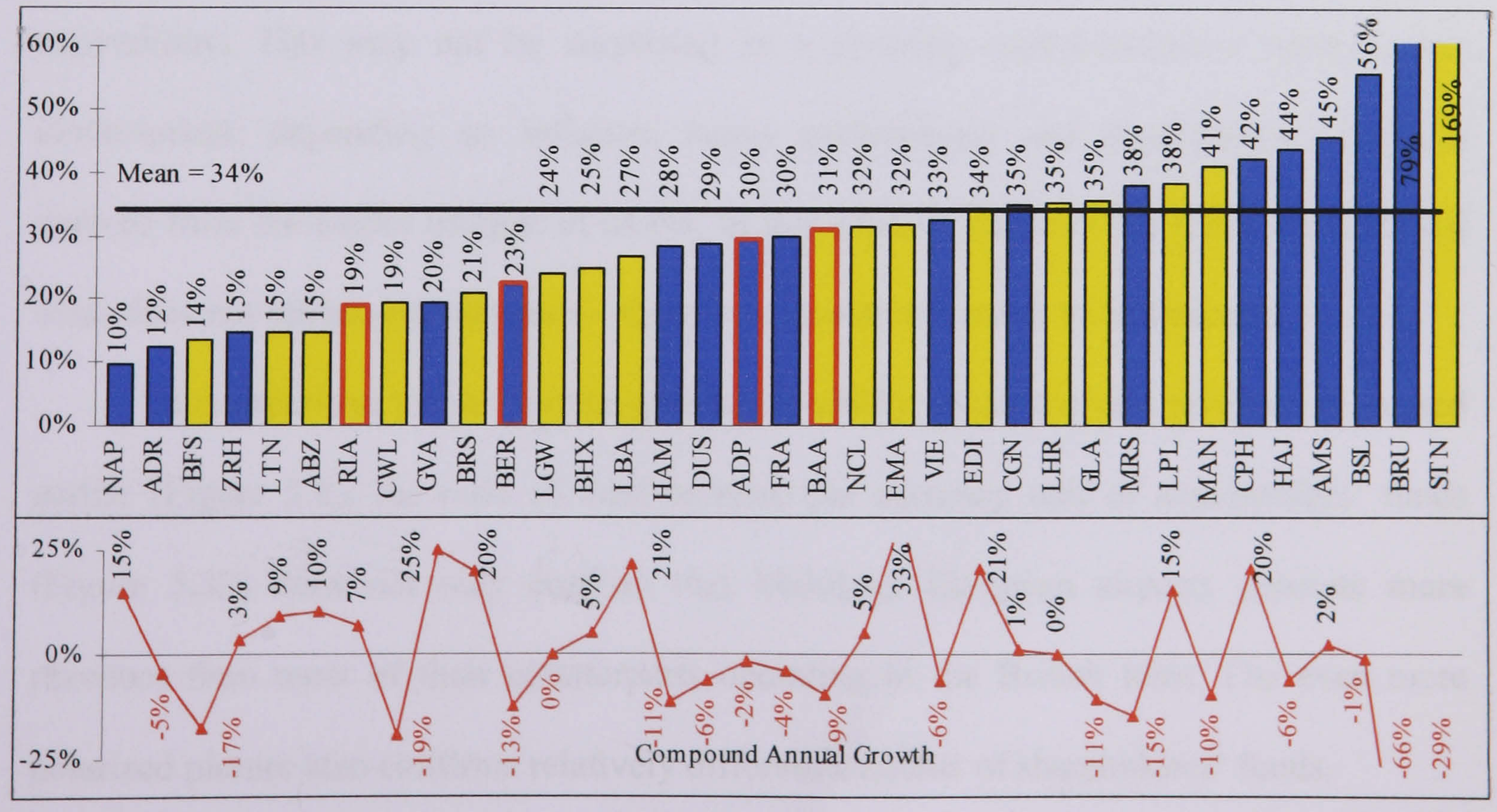

Investment spending per terminal passenger indexed to 1995 (Figure 5.29) is comparatively high for approximately half of the Mainland European airports as well as MAN and STN, whereas roughly two thirds of the sample airports range below sample mean. Capital expenditure is growing the asset base and therefore of course also affecting a variety of other ratios involving i.e. assets, depreciation and cash. Details of the individual investment programmes of sample airports are given in section 4.2.2.2 on factors affecting the performance of individual airports and Appendix B.1, Airport Specifics.

Figure 5.29: Long-term Average of Inflation-Adjusted Capital Expenditure per Terminal Passenger 1990-1999



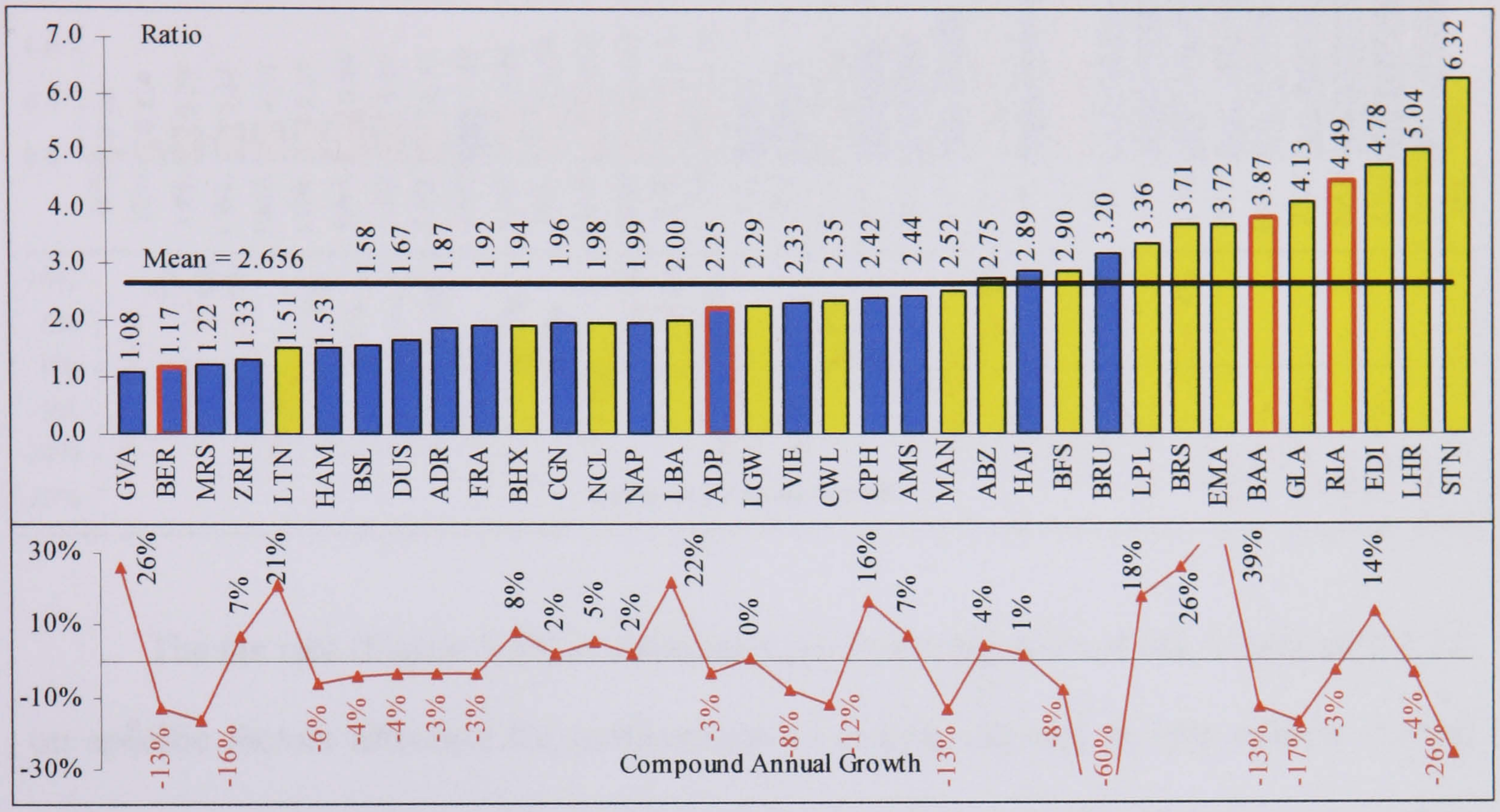

Long-term average capital expenditure as a percentage of total revenue (Figure 5.30) is basically reflecting capital expenditure per terminal passenger above. In both cases STN displays extreme values. While airport systems do not expose a specific pattern, all four range below sample mean.

Figure 5.30: Long-term Average of Capital Expenditure in Percent of Total Revenue 1990-1999



The ratio of long-term average capital expenditure to depreciation (Figure 5.31) reveals again distinct differences between airports in the British Isles versus Mainland European ones.

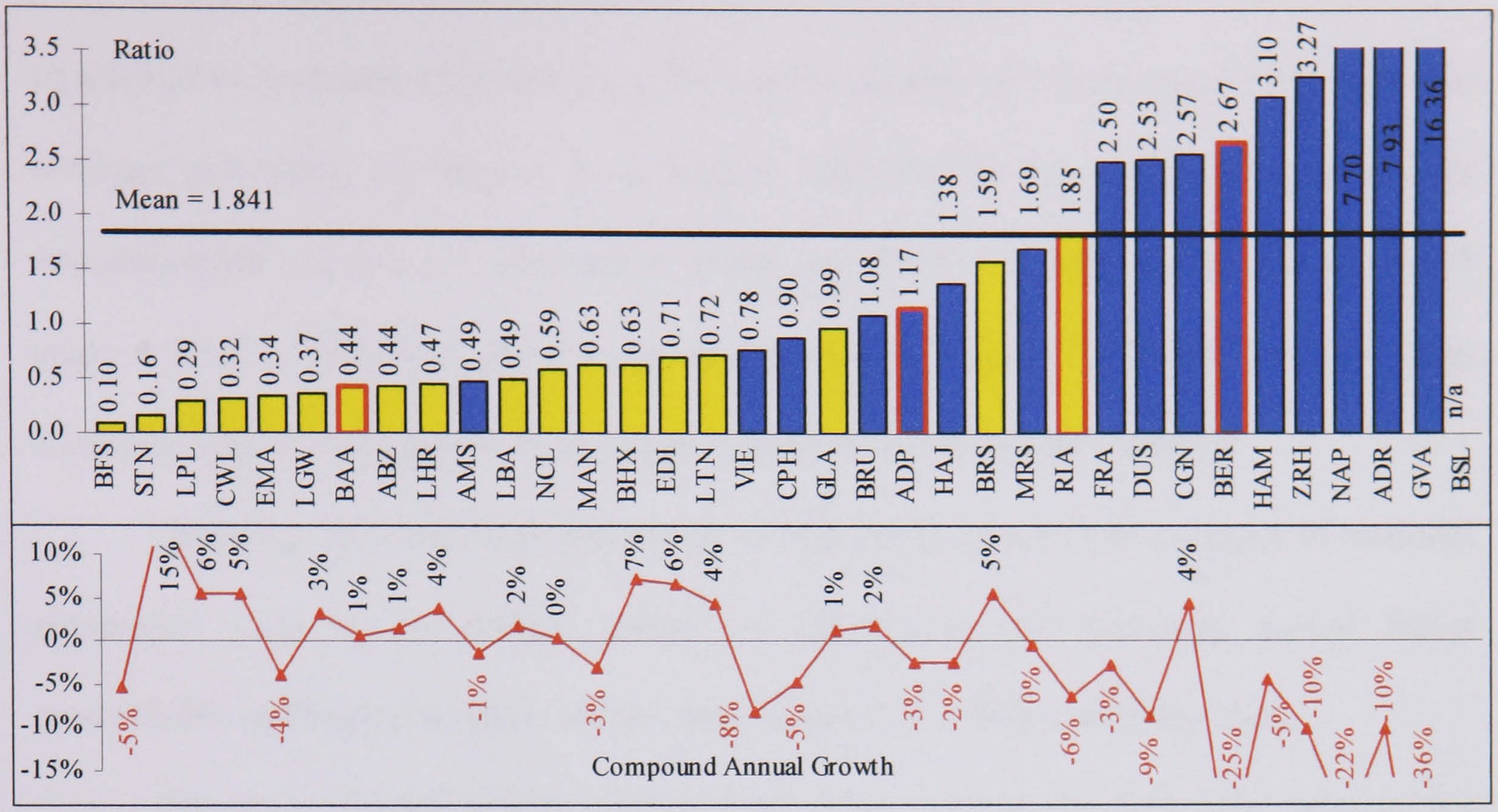
Figure 5.31: Long-term Average of Capital Expenditure to Depreciation Ratio 1990-1999




This ratio is considerably higher and well above average for approximately two thirds of the sample airports operating in the British Isles. In all cases, however, investment spending exceeds depreciation, which in turn is by far not sufficient to finance capital expenditure. This may not be surprising in a growing capital-intensive infrastructure environment, depending on inflation, heavy maintenance and depreciation schedules derived from the useful lifetime of assets. In this context, depreciation based on historical costs does not release enough cash – therefore, investment needs to be financed.

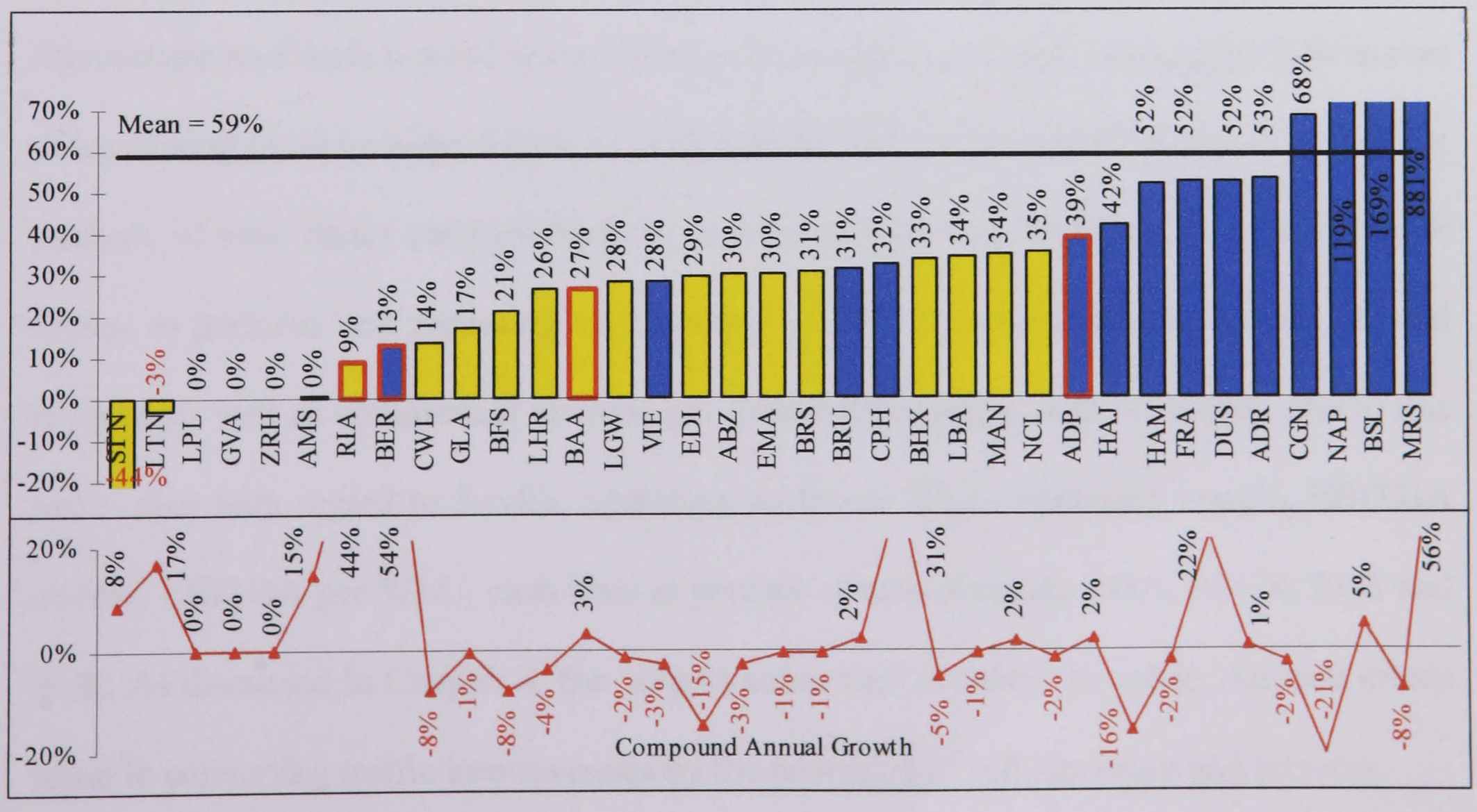
In comparison to the revenue-generation ability as per the unit revenues discussed earlier (Figure 5.8), the ratio of total revenue per currency unit of shareholders' funds (Figure 5.32) does not only confirm that Mainland European airports generate more revenues than most of their counterparts operating in the British Isles. The even more polarised picture also confirms relatively different amounts of shareholders' funds.

Figure 5.32: Long-term Average of Total Revenue per Currency Unit of Shareholders' Funds 1990-1999




The tax rate (Figure 5.33) is a special topic as already pointed out in section 4.2.2.2 on specific factors affecting the performance of sample airports. In this context it shall suffice to state that Mainland European airports reveal considerably higher tax rates than their competitors in the British Isles.

Figure 5.33: Long-term Average of Tax Rate 1990-1999



In addition to primarily focusing on common features by geographic location and partially single airports versus airport systems where appropriate, Table 5.3 below pursues an alternative approach of categorizing the sample airports by size in terms of the ten-year averages of terminal passengers. As defined in Table 4.5, 13 out of the total of 34 sample airports/airport systems are allocated to group one (PAX < 4 mppa), 15 to group two (4 mppa < PAX < 20 mppa) and 6 to group three (> 20 mppa). The BAA Group is again excluded from the calculation of averages in order to avoid double counting.

Grouping the individual airports by size in terms of ten-year averages of terminal passengers adds to the insight gained by calculating and analysing partial factor productivity and financial ratios, since it puts things into a different perspective.

One major finding is that balance sheet ratios, such as the debt ratio, gearing, net assets in percent of total assets and finally financial leverage, seem to reveal distinct differences and a wide spread in terms of percentage points amongst the individual size categories as well as in relation to the total sample mean. As already noted, this is again indicating different capital structures and capital productivity and different approaches to financing productive assets.

Operating and total cost per WLU appear to increase by size, indicating diseconomies of scale beyond approximately four million terminal passengers. (The matter of increasing or decreasing returns to scale will be discussed in detail in the course of the analysis of total factor productivity). In contrast to operating and total cost, big airports appear to perform best regarding total revenue per WLU, non-aeronautical share of total revenue as well as commercial revenue per terminal passenger, and – possibly due to this fact – also with regard to RevEx, operating profit per WLU, operating margin, EBITDA margin, EBITDA per WLU, cash flow in percent of total revenue, ROA, ROCE, ROS and ROE. As discussed in Chapter 4, the 'airport value tree' is rooted in traffic. Airports create value in converting traffic into revenues by the provision of infrastructure and services.

Table 5.3: Long-term unweighted Averages of PFP / FRA Indicators grouped by Airport Size (Average Terminal Passengers 1990-1999)

| **Performance Indicator** | **Total Sample*** | **PAX < 4 mppa** | **4 mppa < PAX < 20 mppa** | **PAX > 20 mppa*** |
|---|---|---|---|---|
| **Partial Factor Productivity** | **34 airports** | **13 airports** | **15 airports** | **6 airports** |
| Total Cost per WLU (indexed to 1995) | 14.62 € | 13.85 € | 14.95 € | 15.48 € |
| Operating Cost per WLU (indexed to 1995) | 13.37 € | 12.80 € | 13.66 € | 13.93 € |
| Depreciation Cost per WLU (indexed to 1995) | 2.23 € | 1.85 € | 2.60 € | 2.16 € |
| Depreciation Share of Operating Cost | 17.16% | 14.00% | 20.46% | 16.18% |
| Labour Share of Operating Cost | 37.74% | 41.08% | 34.71% | 37.69% |
| Asset Utilization (WLU/Total Assets in '000) | 32 | 29 | 37 | 27 |
| Total Asset Turnover | .468 | .419 | .514 | .466 |
| Total Revenue per WLU (indexed to 1995) | 16.10 € | 15.60 € | 15.93 € | 17.55 € |
| Aeronautical Revenue per WLU (ind. to 1995) | 9.21 € | 9.97 € | 8.94 € | 8.18 € |
| Non-Aeronautical Share of Total Revenue | 43.21% | 35.10% | 45.22% | 55.80% |
| Commercial Rev. per Terminal PAX (ind. '95) | 7.30 € | 5.93 € | 7.25 € | 10.36 € |
| Revenue/Expenditure Ratio (RevEx) | 1.125 | 1.153 | 1.085 | 1.159 |
| Return on Total Assets (ROA) | 4.20% | 4.33% | 3.95% | 4.49% |
| Operating Profit per WLU (indexed to 1995) | 2.81 € | 2.80 € | 2.48 € | 3.61 € |
| Return on Capital Employed (ROCE) | 8.16% | 7.17% | 8.69% | 9.06% |
| **Financial Ratios / Indices** | | | | |
| Operating Margin | 16.83% | 17.32% | 13.81% | 22.85% |
| EBITDA Margin | 31.22% | 28.94% | 31.54% | 35.34% |
| EBITDA per WLU (indexed to 1995) | 5.00 € | 4.65 € | 4.99 € | 5.77 € |
| Return on Net Assets (RONA b.I.a.T.) | 25.21% | 14.50% | 33.61% | 27.25% |
| Return on Total Revenue (ROS) | 8.47% | 10.77% | 4.61% | 12.60% |
| Return on Shareholders' Funds (ROE) | 8.67% | 7.71% | 8.51% | 10.95% |
| Debt Ratio | 53.83% | 44.58% | 62.55% | 53.64% |
| Gearing (Debt/Equity Ratio) | 214.27% | 109.09% | 281.75% | 268.15% |
| Net Assets in Percent of Total Assets | 47.79% | 60.12% | 37.72% | 46.36% |
| Financial Leverage | 314.27% | 209.09% | 381.75% | 368.15% |
| Fixed Asset Turnover | .937 | .789 | 1.167 | .731 |
| Cash Flow in Percent of Total Revenue | 22.86% | 22.38% | 22.34% | 25.09% |
| Investment Coverage Ratio (Cash Flow/Capex) | 1.178 | 1.345 | 1.094 | 1.003 |
| Capital Exp. per Terminal PAX (ind. to 1995) | 6.25 € | 4.77 € | 7.74 € | 6.14 € |
| Capital Expenditure in % of Total Revenue | 33.88% | 27.50% | 42.15% | 29.42% |
| Capital Expenditure to Depreciation Ratio | 2.656 | 2.752 | 2.573 | 2.634 |
| Total Rev. per currency unit of Shareh.' Funds | 1.841 | 1.232 | 2.232 | 2.153 |
| Tax Rate | 58.72% | 43.10% | 83.95% | 33.14% |

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
* The BAA Group is excluded from the calculation of averages to avoid double counting.

It is striking that these high volume airports also appear to have the lowest tax rate, abstracting from the individual taxation specifics. Not quite as surprising is the lowest

aeronautical revenue per WLU, against the background of the relatively high non-aeronautical share of total revenue.

While the depreciation unit cost and the depreciation share of operating cost peak in the group of 4 mppa – 20 mppa, the labour share is highest with airports below 4 mppa. The medium-sized airports tend to perform best regarding asset utilization, RONA (b.I.a.T.) and the generation of total revenue per currency unit of shareholders' funds as opposed to the low net assets in percent of total assets and cash flow in percent of total revenue. They also appear to invest most in capacity expansion programmes in terms of capital expenditure per terminal passenger. Nevertheless, they turn fixed and total assets fastest and reveal the lowest capex to depreciation ratio. Their high tax rate, on the other hand, seems to be driven by the specific arrangements i.e. at CGN and MRS as explained in detail earlier.

Sample airports with traffic throughput below 4 mppa appear to have cost advantages and invest the least measured by capital expenditure per terminal passenger and capex to total revenue, resulting in a comparatively high investment coverage ratio (cash flow/capex) as well as a strong RevEx (revenue/expenditure ratio) and ROA.

### 5.1.3 Summary

Major differences between the airports under scrutiny appear to lie in operating efficiency, asset utilization and capital structure. Capital expenditure is growing the asset base with an immediate impact on the majority of ratios.

Whereas smaller airports and those operating in the British Isles seem to be more cost efficient, publicly owned airports and those with a high traffic throughput generate comparatively higher total revenue per WLU.

Regarding the capital structure and financing of their assets, the airports scattered across Mainland Europe and medium to high-volume airports appear to be in a position to

assume more debt relatively to their respective shareholders' funds, resulting in considerably higher gearing and ultimately financial leverage. Since the return on equity is determinated by the return on assets and financial leverage, they do not appear to translate this into significantly higher return rates on equity due to lower operating efficiency in terms of return rates on assets. It needs to be analysed in detail, if this may or may not be attributable to the comparatively high proportion of publicly owned versus partially and fully privatised airports in the British Isles.

Airport size in terms of traffic throughput appears to be correlated with cost advantages of sample airports below four million terminal passengers. On the other hand, EBIT per WLU and EBITDA per WLU seem to be boosted by higher traffic volume, most notably beyond twenty million terminal passengers.

No consistent pattern could be detected in respect to airport systems, other than that the BAA Group appears to operate more cost efficiently in comparison to ADP, RIA and especially BER.

During the next stage of data analysis, total factor productivity (TFP) will be investigated by data envelopment analysis (DEA). DEA results will complement partial factor productivity indicators and financial ratios in order to arrive at a more comprehensive, true and correct picture of the subjects as elaborated on in Chapter 2. It will also address the issue of economies to scale. Airport size and geographical location (British Isles vs. Mainland Europe) will again be criteria for the formation of grouped results. Moreover, 'ownership structure' will be introduced as an additional characteristic, to narrow down the focus on publicly owned versus privatised airports.

## 5.2 Total Factor Productivity – Data Envelopment Analysis

As discussed in Chapter 2, data envelopment analysis is a research tool for assessing total factor productivity. DEA is a non-parametric method of measuring performance, based on a ranking concept of the relative efficiency of a set of decision making units (DMUs) which are engaged in performing the same function. It relates to 'best' or 'efficient' rather than average performance. In carrying out so-called dominance comparisons of the production units' inputs and outputs, DEA applies a relative efficiency concept; efficiency is not measured in absolute terms but in relation to the sample. The most efficient DMUs are located on the frontier or envelope with a relative index of 1.00 while lower values indicate inefficiencies. Regressing the single index per DMU on operational and environmental factors may allow to reveal the sources of efficiency variations (Charnes, Cooper, Lewin & Seiford 1994; Charnes, Cooper & Rhodes 1978; Cooper, Seiford & Tone 2000; Thanassoulis 2001).

The essential idea of DEA is to evaluate how efficiently each decision making unit is handling the input/output transformation process when compared to other DMUs engaged in that same process. A DMU is Pareto-efficient if it is not possible to lower anyone of its input levels without increasing at least another one of its input levels and/or without lowering at least one of its output levels. This means, a Pareto-efficient DMU will lie on the efficient frontier and its technical efficiency will be one whether it is measured in the input or in the output orientation (Thanassoulis 2001).

This chapter is concerned with measuring technical input efficiency which is defined as follows:

> "Let all inputs of a DMU be contracted radically as far as feasible, without detriment to its output levels. The technical input efficiency of the DMU is the maximum proportion any one of its contracted input levels is of the observed level of that input" (Thanassoulis 2001, p.24).

Input allocative efficiency or input overall efficiency will not be measured.

DEA actually determines the relative inefficiency (rather than efficiency) of the sample airports by comparing the respective inputs to the minimum inputs necessary, given the corresponding output. This is the estimation of the maximum feasible contraction of the input levels of the DMU within the production possibility set (PPS). As elaborated on earlier, DEA only requires minimal assumptions about how the factors of production and the outcomes relate to each other and does not hypothesize a functional form between them. It also does not require to prescribe weights to be attached to each input and output as in the usual index number approaches (Cooper et al 2000; Thanassoulis 2001).

In the subsequent statistical procedures the input oriented approach is applied, because some airports may be facing restrictions on i.e. the maximum number of aircraft and/or passenger movements allowed under the respective local regulations or may be experiencing difficulties in obtaining expansion permission or in accessing the capital markets to finance investment in additional facilities eventually required to cope with traffic growth. The input oriented model also allows to determine the most productive scale size (MPSS) (Pels et al 2001).

In terms of model-techniques, the input oriented Banker-Charnes-Cooper model (BCC-i-model) is used to analyse the sample airports. It has its production frontiers spanned by the convex hull of existing DMUs. The frontiers have piece-wise linear and concave characteristics which leads to variable returns-to-scale characterizations (Cooper et al 2000).

Three sub models were generated by varying the respective output variables which consist of monetary and/or physical parameters. Nevertheless, in DEA terminology all three sub models are measuring the relative technical input efficiency of the transformation process carried out by the sample airports. The following input and output variables are applied in particular:

Table 5.4: DEA / BCC-i-Model: Input / Output Variables

| Sub-Model | Focus | Input | Output | Results |
|---|---|---|---|---|
| Physical and Financial Efficiency | Total Factor Input vs. Total Physical plus Total Financial Output | Total Costs (including Depreciation) | Terminal PAX, Air Cargo, Total Revenue | Appendix, Table B.5.1 |
| Physical Efficiency | Total Factor Input vs. Total Physical Output | Total Costs (including Depreciation) | Terminal PAX, Air Cargo | Appendix, Table B.5.2 |
| Financial Efficiency | Total Factor Input vs. Total Financial Output | Total Costs (including Depreciation) | Total Revenue | Tables 5.5 - 5.8, Figures 5.34 - 5.39, Appendix, Tables B.5.3 and B.5.6 |

Total costs represent the total factor input of the respective period, including depreciation to reflect the capital invested in productive assets during previous periods. Output is constituted by either total revenue regarding the sub model 'financial efficiency', or the physical throughput measures terminal passengers and air cargo, or a mixture of both, in the case of the sub model 'physical and financial efficiency'. Hence, the sub models 'physical and financial efficiency', 'physical efficiency' and 'financial efficiency' are created by simple variation of the combination of output variables after which they were labelled. These simple and straightforward variables are preferred to e.g. principal component analysis or using a common set of weights in order not to move away from reality. The rationale is analogous to the application of unadjusted data, which is a prerequisite for DEA as described earlier.

The calculation of all DEA results as summarized for the total sample in Table 5.5 below was supported by the Data Envelopment Analysis Software Package for Windows® (DEA-Solver, © 2000, Kluwer Academic Publishers). The individual comparative efficiency scores and returns to scale for each individual sample airport and financial year for all three sub models are attached in Appendix B.5, Results of Data Envelopment Analysis, Tables B.5.1-B.5.3. The BAA Group is always excluded from the calculation of the respective total sample average efficiency in order to avoid double counting.

Table 5.5: Total Sample DEA Results (Annual Scores) of the three BCC-i-Sub Models

| **DEA Scores Total Sample: Sub Model 'Physical & Financial Efficiency'** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
| Average Efficiency | .88062 | .86766 | .85589 | .79251 | .82793 | .87060 | .87350 | .84186 | .81841 | .81865 |
| Minimum Efficiency | .62415 | .54458 | .48346 | .49650 | .47785 | .50862 | .46115 | .34491 | .30401 | .60309 |
| Standard Deviation | .11552 | .11784 | .12629 | .15696 | .13170 | .12115 | .12313 | .13503 | .14570 | .12503 |
| **DEA Scores Total Sample: Sub Model 'Physical Efficiency'** | | | | | | | | | | |
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
| Average Efficiency | .78221 | .77474 | .71653 | .70533 | .72861 | .71169 | .68480 | .64887 | .65933 | .66240 |
| Minimum Efficiency | .37917 | .37903 | .31410 | .28620 | .32029 | .30158 | .27126 | .24423 | .24285 | .22519 |
| Standard Deviation | .20750 | .19725 | .23004 | .23410 | .21976 | .22498 | .23487 | .24307 | .25612 | .25061 |
| **DEA Scores Total Sample: Sub Model 'Financial Efficiency'** | | | | | | | | | | |
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
| Average Efficiency | .82615 | .81282 | .81110 | .72277 | .76456 | .83905 | .83416 | .80844 | .76241 | .76754 |
| Minimum Efficiency | .58734 | .51045 | .48346 | .40549 | .44896 | .50086 | .43618 | .33232 | .28915 | .56347 |
| Standard Deviation | .12010 | .12319 | .12861 | .15558 | .11670 | .11920 | .12149 | .13283 | .13717 | .12402 |

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
BAA Group is excluded from average to avoid double counting.

The DEA analyses of technical input efficiency via the three BCC-i-sub models demonstrate a high discrimination between sample airports. This becomes manifest in the comparatively small amount of efficient airports with a score of 1.00 and is also indirectly denoted by the respective average and minimum efficiency and standard deviation. The sub model 'financial efficiency' reveals the highest discriminatory power resulting in the lowest number of four efficient DMUs, followed by the sub models 'physical efficiency' and 'physical and financial efficiency' with six and eight efficient airports, respectively.

Average efficiency and standard deviation are similar for 'physical and financial' and 'financial efficiency', whereas average 'physical' efficiency is markedly lower and standard deviation considerably higher. The average 'physical and financial' efficiency varies from min. 0.79251 in 1996 and max. 0.88062 in 1999, with a standard deviation (SD) of min. 0.11552 in 1999 and max. 0.15696 in 1996. Average 'physical' efficiency ranges from min. 0.64887 in 1992 and max. 0.78221 in 1999, with a SD of min. 0.19725 in

1998 and max. 0.25612 in 1991. Average 'financial efficiency' varies from min. 0.72277 in 1996 and max. 0.83905 in 1994, with a SD of min. 0.11670 in 1995 and max. 0.15558 in 1996.

It is worthwhile noting that the sub set of 'efficient' airports or airport systems defined as achieving DEA scores of 1.00 in at least six out of ten years consisting of the BAA Group, CWL, LHR and LPL in the 'financial' sub model remains stable over all three sub models. Others, in contrast, such as AMS, BRU, EMA and FRA drop out gradually. Before turning to a detailed comparison of the total factor productivity of individual sample airports, Table 5.6 summarizes the findings of the three sub models so far.

Table 5.6: Comparison of Results of the three BCC-i-Sub Models

| **Sub Model / Results** | **Physical & Financial Efficiency** | **Physical Efficiency** | **Financial Efficiency** |
|---|---|---|---|
| Average Efficiency | min. 0.79251 in 1996<br>max. 0.88062 in 1999 | min. 0.64887 in 1992<br>max. 0.78221 in 1999 | min. 0.72277 in 1996<br>max. 0.83905 in 1994 |
| Standard Deviation | min. 0.11552 in 1999<br>max. 0.15696 in 1996 | min. 0.19725 in 1998<br>max. 0.25612 in 1991 | min. 0.11670 in 1995<br>max. 0.15558 in 1996 |
| Number of efficient DMUs (score = 1.00) | min. 8 in 96+95+92+90<br>max. 11 in 1993 | min. 6 in 1993+1992<br>max. 9 in 1999-1997 | min. 4 in 1995+1992<br>max. 5 all other years |
| Efficient DMUs/ Sample Airports →<br><br>(criterion: min. 6 out of 10 years are max. efficient = DEA score of 1.00) | AMS (10 out of 10)<br>**BAA (10 out of 10)**<br>BRU (8 out of 8)<br>CWL (10 out of 10)<br>EMA (8 out of 10)<br>FRA (6 out of 10)<br>LHR (10 out of 10)<br>LPL (9 out of 10) | AMS (10 out of 10)<br>**BAA (10 out of 10)**<br>BRU (8 out of 8)<br>CWL (7 out of 10)<br>---<br>FRA (6 out of 10)<br>LHR (10 out of 10)<br>LPL (9 out of 10) | ---<br>**BAA (10 out of 10)**<br>---<br>CWL (10 out of 10)<br>---<br>---<br>LHR (10 out of 10)<br>LPL (7 out of 10) |

Airports British Isles = yellow, Mainland Europe = blue; Airport systems = **bold**

From the perspective of the sub model 'financial efficiency' – measuring technical input efficiency based on financial input and output variables exclusively – there also appears to be a basic difference as to airports in Mainland Europe as opposed to their competitors in the British Isles in terms of rank per score and the number of efficient sample airports. As a matter of fact, the latter group comprises airports in the British Isles exclusively. This is again pointing to differences between sample airports due to ownership

structure quantified by the number of fiscal years under public, mixed, or completely private ownership, as stated earlier. In addition to that, in all three sub models only one out of four airport systems, being the BAA Group, is amongst the efficient sample airports.

It has to be noted, however, that LPL's (and partly CWL's) high score is due to the fact that the input oriented BCC-model recognises DMUs with a minimum input value for any input item as efficient. As it is actually minimising any input combination at a given output level, higher costs can be compensated for by higher revenues in the sub model 'financial efficiency', as it is a basic principle of any business. The sub model 'physical efficiency' tends to favour airports which have the lowest cost base (i.e. due to outsourcing of services) and this holds also true with respect to the sub model 'physical and financial efficiency', suggesting an output combination of financial and physical variables and hence does not (fully) allow to make up for increased costs by additional revenues.

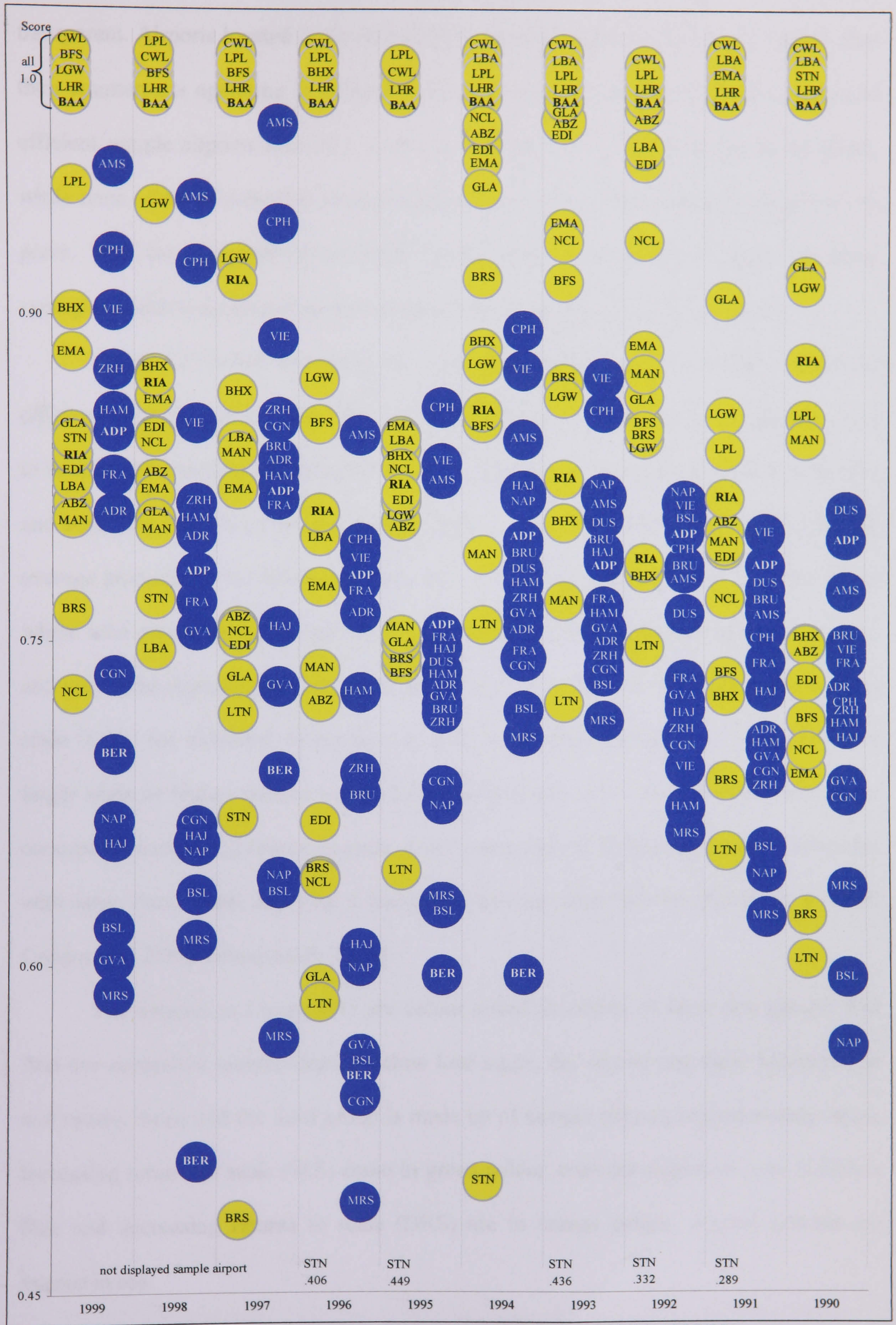
Since the focus of this study is on financial performance from the investor's point of view, the following will concentrate on 'financial efficiency' defined by strictly monetary variables. Focusing on financial variables is actually another genuine contribution to the body of research on the subject in addition to the previous DEA work primarily based on physical measures, which also do not account for unit input costs.

Figure 5.34 below illustrates the results of the sub model 'financial efficiency', the maximum value of 1.00 implying an efficient airport or airport system. All sample airports are ranked according to their score of the respective financial year. Airports in the British Isles are in yellow, while their Mainland European competitors are coloured blue. Airport systems come in bold print. A detailed compilation of scores in tabulated form is attached in Appendix B.5, Table 3.

Key to Figure 5.34 on DEA Scores, Sub Model Financial Efficiency

| | |
|---|---|
| Airports in the British Isles | Airports Mainland Europe |
| Airport Systems = **bold** | |

Figure 5.34: DEA Scores, Sub Model Financial Efficiency




Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98

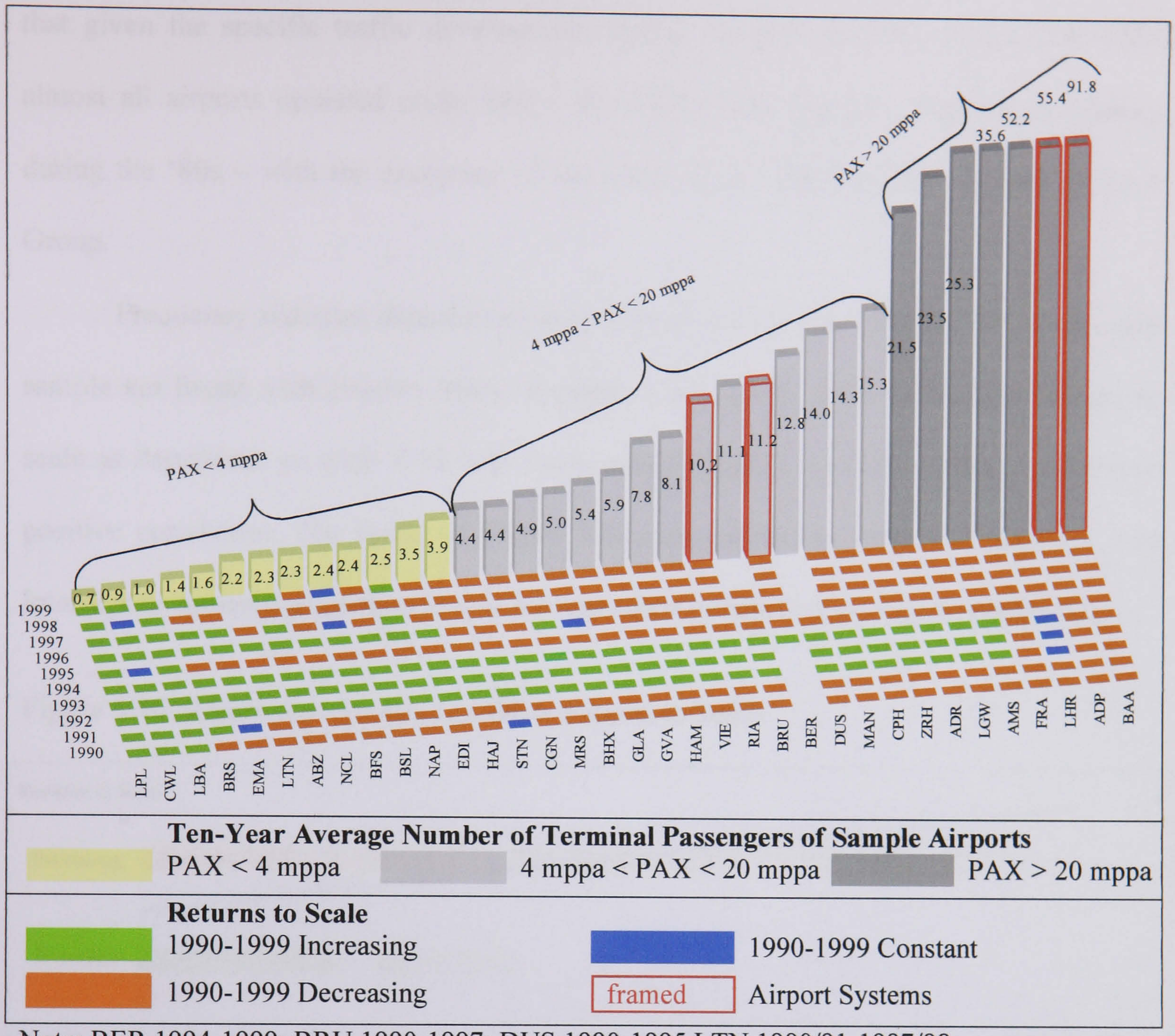
Airport systems = **bold;** Geographical location: British Isles; Mainland Europe

Figure 5.34 makes the efficiency differences between sample airports very transparent. Airports located in the British Isles appear to achieve higher DEA scores than their counterparts operating in Mainland Europe. There is even a considerable overlap of efficient sample airports with DEA scores of 1.00 each in the upper portion of the graph, while none of the Mainland European airports ever achieves full efficiency relative to its peers. With the exception of the BAA Group, airport systems do not appear to enjoy synergies which would translate into increased efficiency in terms of DEA scores.

Figure 5.35 below illustrates the scale characteristics of the sub model 'financial efficiency' for the period 1990-1999. As regards returns to scale (RTS), the picture seems to be more diverse than regarding DEA scores. RTS are a property of the efficient frontier and state how total factor output changes upon a variation in total factor input – or how average productivity is affected by scale size. Increasing returns to scale (IRS) are found where total output increases more than proportionately or by a multiple greater than one, and vice versa regarding decreasing returns to scale (DRS). Otherwise, constant returns to scale (CRS) are exhibited. Economies to scale in production means that production at a larger scale or higher volume can be achieved at lower cost, which is equivalent to the concept of (increasing) returns to scale. Scale economies are frequently found in industries with large fixed costs, enjoying a decreasing average cost function (Coelli et al 1998; Cooper et al 2000; Thanassoulis 2001).

The airports in Figure 5.35 are colour coded according to three size groups. The first one comprises sample airports below four mppa, the second one those between four and twenty mppa and the third group is made up of sample airports beyond twenty mppa. Increasing returns to scale (IRS) come in green colour, constant returns to scale (CRS) in blue and decreasing returns to scale (DRS) are in orange colour. Airport systems are framed in red.

Figure 5.35: DEA Returns to Scale and Traffic Volume of Sample Airports 1990-1999




Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995 LTN 1990/91-1997/98

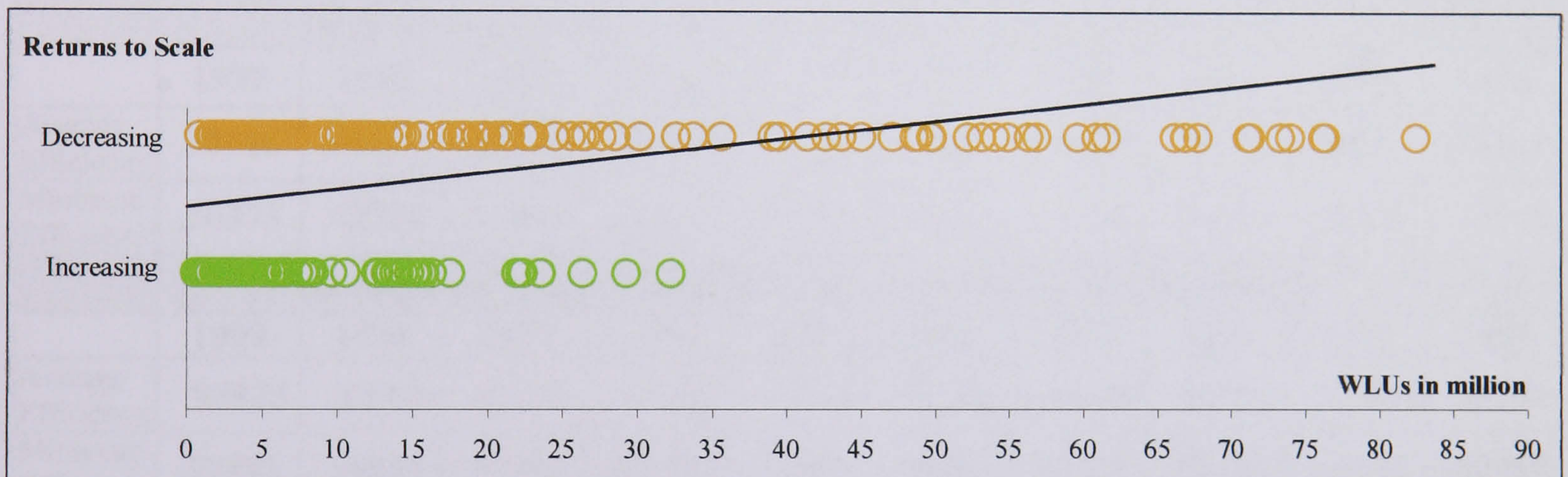
All sample airports are ranked according to their long-term average annual traffic volume in terms of terminal passengers. The comparison of the scale characteristics of the individual sample airports and the respective traffic throughput reveals a general trend of small to medium-sized sample airports to operate under IRS, whereas airports and airport systems with traffic volumes in excess of approximately three to four million terminal passengers seem to operate under CRS or DRS.

In statistical terms, returns to scale for inefficient airports are identified with the projected point on the efficient frontier. RTS appear to be correlated with traffic throughput and positively volume driven up to a threshold of 4 mppa but revert to diseconomies beyond that volume range. As far as DEA returns to scale are concerned,

regional airports appear to have an advantage over hub airports. It is noteworthy, however, that given the specific traffic development during the post-Gulf War years 1992-1994 almost all airports operated under IRS – benefiting from capacity installed in advance during the '80s – with the exception of the hubs FRA, LHR and ADP as well as BAA Group.

Frequency statistics demonstrate that 59% of IRS versus 25% of DRS of the total sample are found with airports below 4 mppa. A regression analysis on DEA returns to scale as dependent vs. total WLUs as independent variable confirms a highly significant positive correlation. The footer of Figure 5.36 summarizes the main test statistics. The intercept or constant is labelled $b_0$ and the regression coefficient or slope is labelled $b_1$.

Figure 5.36: Regression Analysis on DEA Returns to Scale




| Independent | Dependent | Mth | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|---|
| TOTALWLU | DEARTS | LIN | .122 | 316 | 43.85 | 6.622 | .000 | .4613 | 1.0E-08 |

Under VRS of the (input oriented) Banker-Charnes-Cooper model (BCC-i-model) as applied so far, productivity is affected by scale size. Scale efficiency by definition measures the impact of scale size on the productivity of a DMU/sample airport or the divergence between the efficiency rating under CRS and VRS respectively. The VRS scores discussed above were obtained in controlling for the scale size, which CRS efficiency ratings do not. Since this is the only difference in arriving at the two efficiency measures the deviation captures the impact of the scale size on the productivity of the sample airports. Mathematically, the measure of distance is defined as the ratio of technical

(input) efficiency and pure technical (input) efficiency, or plainly CRS over VRS scores. Since the technical efficiency of a DMU cannot exceed its pure technical efficiency in either orientation, scale efficiency is always ≤ 1.00 (Cooper et al 2000; Thanassoulis 2001).

Table 5.7 displays DEA 'financial efficiency' scores of the total sample under VRS (resulting from the BCC-i-model) and under CRS (resulting from the CCR-i-model) as well as the scale scores or scale efficiency calculated as CCR-i- over BCC-i-scores:

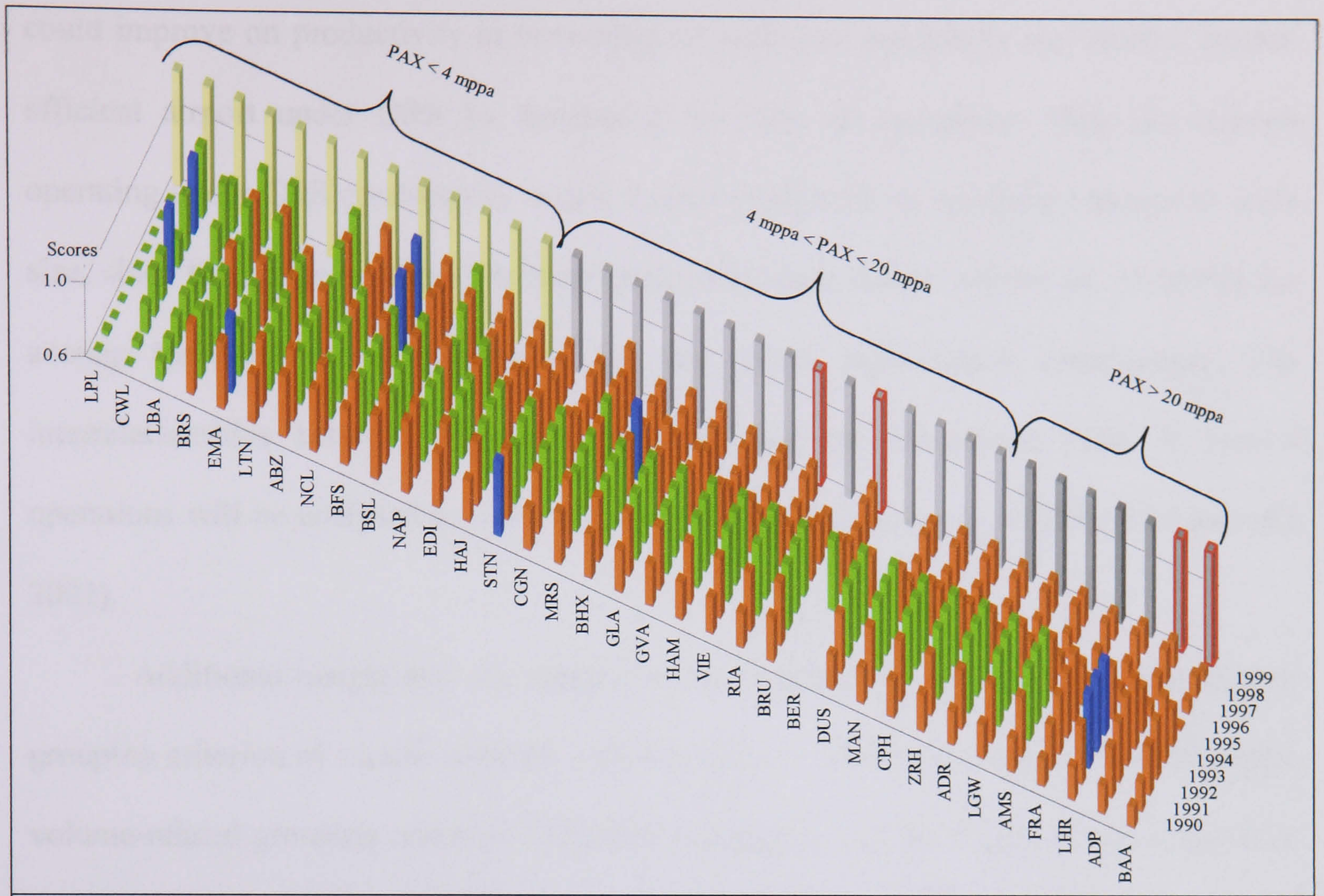
Table 5.7: Total Sample DEA Results (Annual Scores) Sub Model 'Financial Efficiency'

| **DEA Variable Returns to Scale: BCC-i-Scores Total Sample** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
| Average Efficiency | .82615 | .81282 | .81110 | .72277 | .76456 | .83905 | .83416 | .80844 | .76241 | .76754 |
| Minimum Efficiency | .58734 | .51045 | .48346 | .40549 | .44896 | .50086 | .43618 | .33232 | .28915 | .56347 |
| **DEA Constant Returns to Scale: CCR-i-Scores Total Sample** | | | | | | | | | | |
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
| Average Efficiency | .70526 | .69621 | .66854 | .58282 | .67905 | .78650 | .78425 | .74575 | .70031 | .64045 |
| Minimum Efficiency | .50373 | .42754 | .47940 | .39332 | .41039 | .47886 | .41728 | .30583 | .28332 | .52192 |
| **DEA Scale Efficiency (Scale Scores = CCR-i- over BCC-i-Scores)** | | | | | | | | | | |
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
| Average Efficiency | .85873 | .85909 | .83270 | .82050 | .89243 | .94228 | .94484 | .92792 | .92486 | .84181 |
| Minimum Efficiency | .52495 | .54835 | .53592 | .45252 | .45025 | .50987 | .52323 | .59156 | .65045 | .60769 |

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
BAA Group is excluded from average to avoid double counting.

The CRS ratings for the sub model 'financial efficiency' were calculated by the (input oriented) Charnes-Cooper-Rhodes model (CCR-i-model). Unlike the BCC-i-model, the CCR-i-model's production possibility set (PPS) is based on the constant returns to scale assumption and thus its efficient production frontier has constant returns to scale characteristics. The actual CCR-i and resulting scale efficiency scores are compiled in Appendix B.5, Tables B.5.4 and B.5.5. Figure 5.37 illustrates the scale (input) efficiency for the period 1990 through 1999. Sample airports are grouped and colour coded as before.

Figure 5.37: Scale Efficiency and Returns to Scale of Sample Airports 1990-1999




**Ten-Year Average Number of Terminal Passengers of Sample Airports**

PAX < 4 mppa | 4 mppa < PAX < 20 mppa | PAX > 20 mppa

**Score Colours = Returns to Scale**

1990-1999 Increasing | 1990-1999 Constant

1990-1999 Decreasing | framed: Airport Systems

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98

It generally holds true that the higher the difference between VRS/BCC-i and CRS/CCR-i scores the lower the value of scale efficiency and the more adverse the impact of scale size on productivity. Moreover, Figure 5.37 reveals a trend of decreasing scale efficiency in parallel to increasing traffic volume. Consistently with the findings regarding returns to scale, this applies primarily to sample airports with a traffic throughput beyond 4 mppa which appear to operate beyond their most productive scale size (MPSS). This is resulting in a decreasing impact of scale size on productivity. Also airport systems do not appear to enjoy positive scale effects which would translate into significantly increased scale efficiency.

Theoretically, it is quite obvious that a Pareto-efficient airport operating under IRS could improve on productivity in increasing its scale size marginally and another Pareto-efficient airport under DRS by decreasing its scale of operations. Only for airports operating under CRS productivity would remain unaffected by marginal changes in scale size, since this is the 'optimal' or most productive scale size to operate at. At MPSS the average productivity is maximized for any given input-output combination. The interrelationships between economies of scale and the investment cycle in airport operations will be analysed in more detail in Chapter 7 (Cooper et al 2000; Thanassoulis 2001).

Additional insight into the subject matter is gained by replacing the geographical grouping criterion of sample airports – British Isles vs. Mainland Europe – and the traffic volume-related grouping criterion – terminal passengers – by the degree of privatisation in terms of publicly owned versus partially privatised versus fully privatised airports.

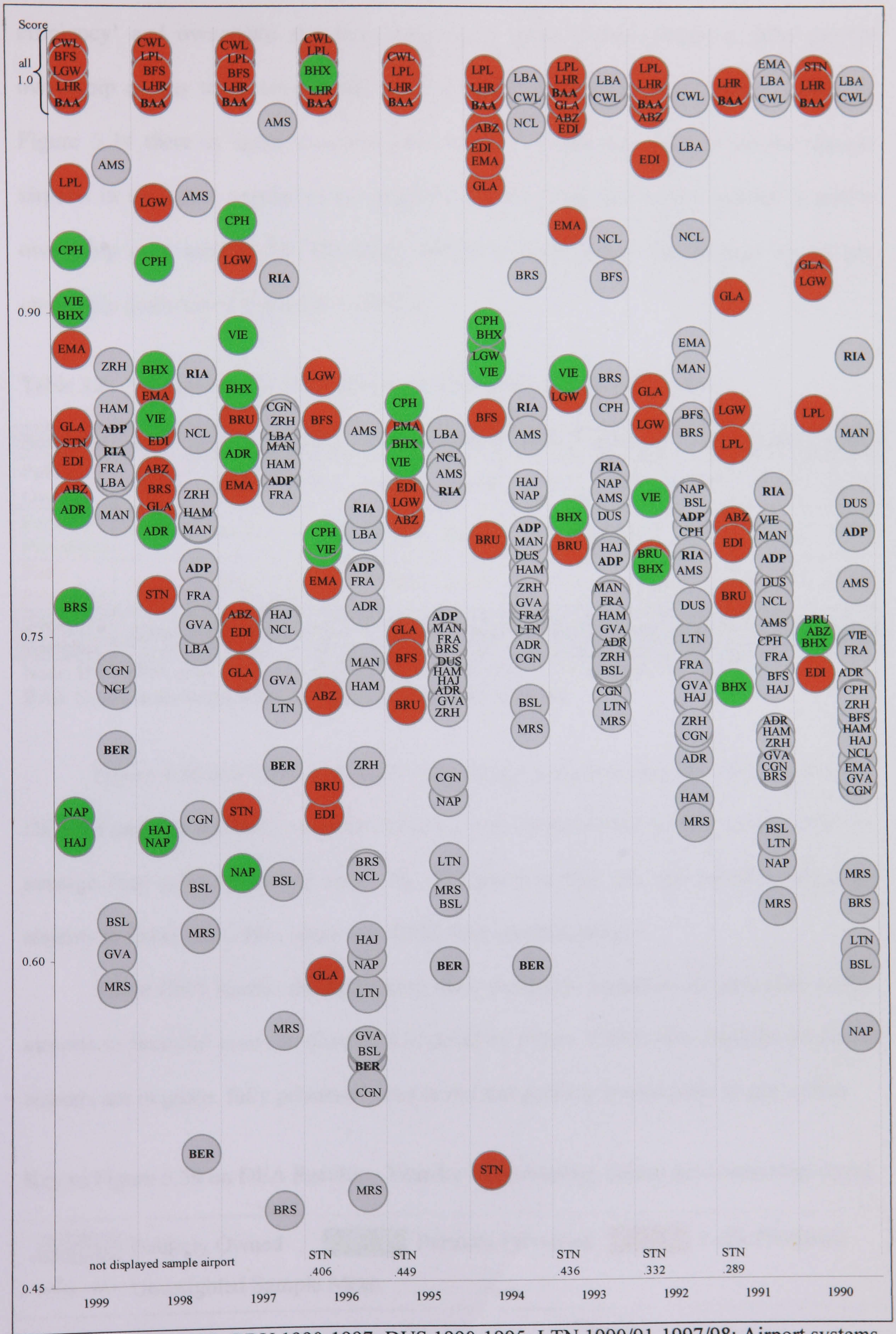
In doing so, Figure 5.38 below displays a relation between BCC-i scores under VRS and the ownership status of the sample airports, adding another perspective to the DEA results of the sub model 'financial efficiency' discussed above. The sample airports are ranked annually according to scores. It has to be noted that the ownership structure changes during the period under consideration for nine of the sample airports. These are ADR, BRS, CPH, HAJ, NAP and VIE, which were partially privatised and the fully privatised BFS, CWL and EMA. Partially privatised airports are in green, fully privatised ones in red and publicly owned ones in grey colour. Airport systems are in bold print. A detailed compilation in tabulated form is attached in Appendix B.5, Table 6.

Key to Figure 5.38 on DEA Financial Efficiency and Ownership Structure

Publicly Owned  Partially Privatised  Fully Privatised

Airport Systems = **bold**

Figure 5.38: DEA Financial Efficiency and Ownership Structure




Note: BER 1992-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98; Airport systems = **bold**; Degree of privatisation publicly owned; partially privatised; fully privatised

Figure 5.38 actually reveals a robust pattern of DEA scores in terms of 'financial efficiency' and ownership structure. Airports in mixed public-private or fully private ownership appear to achieve higher DEA scores than publicly owned ones. Similar to Figure 5.34 there is again a considerable overlap of efficient fully privatised sample airports in the upper portion of the graph, while only very few of the airports in public ownership ever achieve full efficiency relative to their peers. The average scores per ownership group are compiled in Table 5.8.

Table 5.8: Average Annual DEA Scores per Ownership Group 1990-1999

| **Sub Set** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|
| Publicly Owned | .77161 | .75427 | .77000 | .66858 | .72646 | .80744 | .81065 | .79517 | .75771 | .73602 |
| Partially Privatised | .80430 | .79693 | .83416 | .86203 | .84307 | .88477 | .83840 | .79790 | .72480 | .74860 |
| Fully Privatised | .91781 | .90591 | .86415 | .77840 | .81243 | .89177 | .89070 | .84925 | .78123 | .86446 |
| **Total Sample** | **.82615** | **.81282** | **.81110** | **.72277** | **.76456** | **.83905** | **.83416** | **.80844** | **.76241** | **.76754** |

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
BAA Group is excluded from average to avoid double counting.

Figure 5.38 and Table 5.8 clearly show higher technical input efficiency in terms of DEA for partially and fully privatised airports, which consistently achieve higher scores on average than publicly owned ones. The exception to this rule are partially privatised airports in fiscal year 1991, when only BHX falls into this group.

These DEA results are suggesting more profitable operation of privatised sample airports in financial terms as illustrated in detail by Figure 5.39 below. Partially privatised airports are in green, fully privatised ones in red and publicly owned ones in grey colour.

Key to Figure 5.39 on DEA Results – Year-by-Year Average Scores per Ownership Group

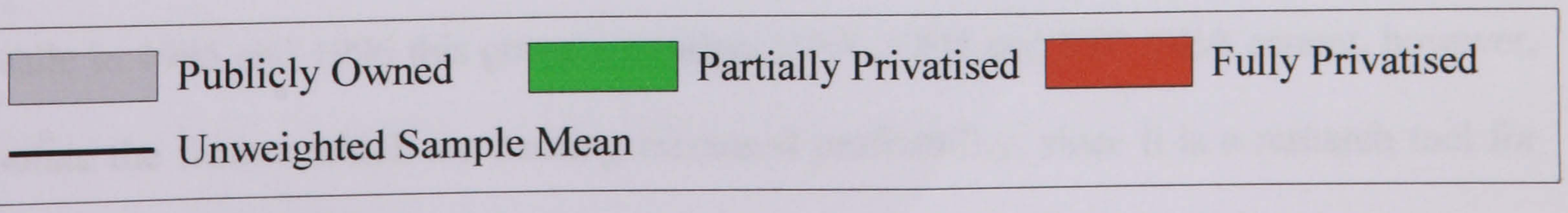
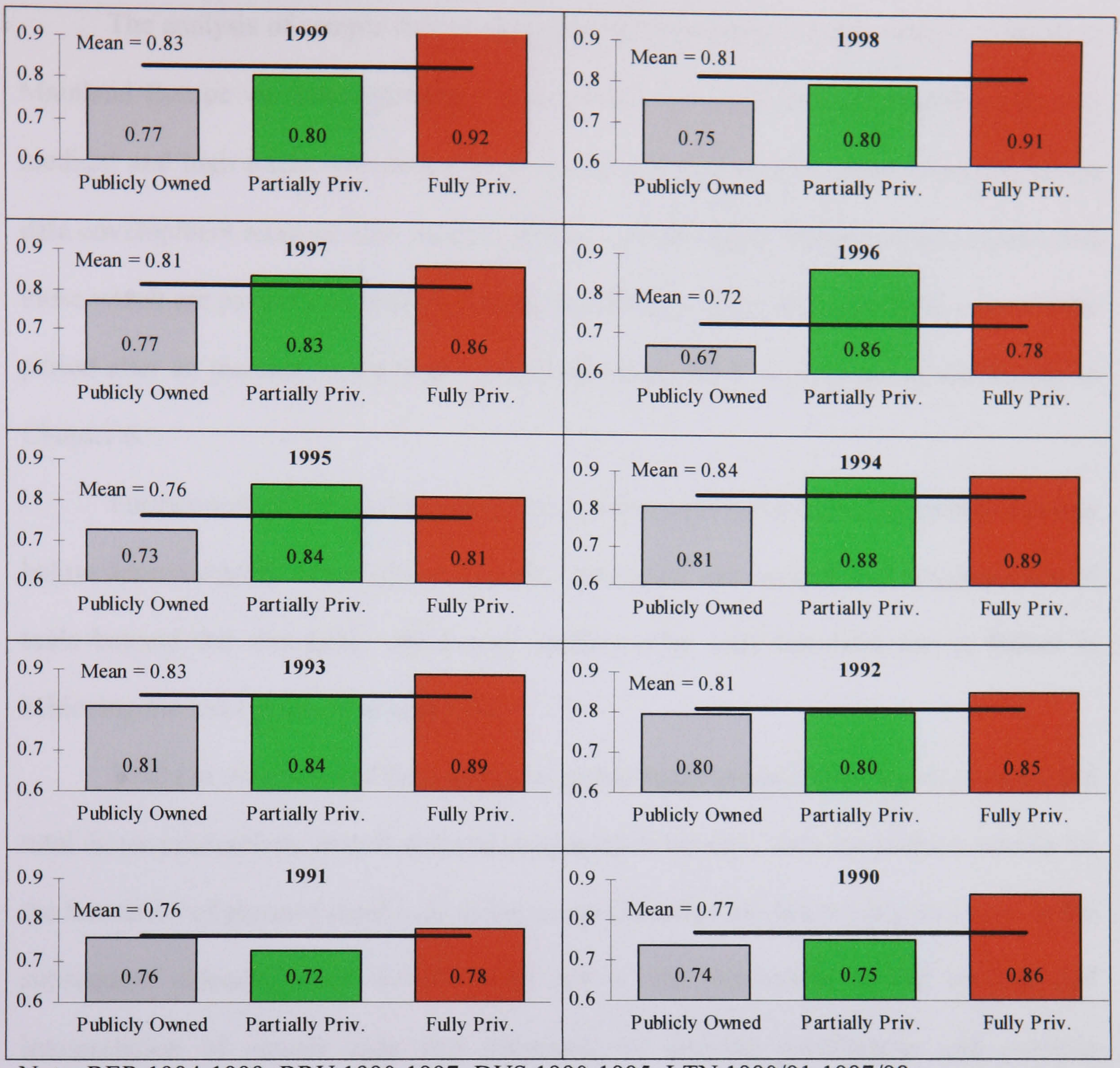


Figure 5.39: DEA Results – Year-by-Year Average Scores per Ownership Group




Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
BAA Group is excluded from average to avoid double counting.

Furthermore, there also appear to be differences between partially privatised and fully privatised sample airports in terms of total factor productivity. Except for fiscal 1995 and 1996 the mixed PPPs do not meet the efficiency level of the fully privatised airports, but achieve higher scores on average than publicly owned airports for the full period other than in 1991. In 1991 the partially privatised airports are represented by BHX exclusively, while in 1995 and 1996 this group comprises BHX, CPH and VIE. DEA cannot, however, isolate the factors which are causing increased profitability, since it is a research tool for total factor productivity by nature.

## 5.3 Summary

The analysis of sample data so far revealed differences between airports situated in Mainland Europe vs. those operating in the British Isles and between airports with low, medium and high traffic volumes. Moreover, the analysis of total factor productivity via data envelopment analysis also suggests differences between publicly owned airports and those which are partially or fully privatised. In addition, it suggests improved scores in the period after an increase in the degree of privatisation, which will be tested statistically in Chapter 6.

Furthermore, DEA analysis suggests economies of scale regarding sample airports below approximately four million terminal passengers per annum and diseconomies of scale beyond this threshold, where scale inefficiencies were identified due to failure in achieving the most productive scale size.

While in the course of the analysis of partial factor productivity, financial ratios and total factor productivity airport size and geographical location were the primary criteria for the formation of grouped results, focusing on the characteristic 'ownership structure' in the subsequent extended data analysis shall add a new dimension to the analysis and interpretation of sample data and ultimately to drawing conclusions and possibly generalizing them. Consequently, public versus private ownership will be the main predictor for t-tests and regression analysis in testing the two hypotheses stated at the outset.

Data envelopment analysis did not require prescribing the functional forms which are now needed in the statistical regression approaches. It considered 'best performance' and evaluated all subjects by the deviation from the efficient frontier. The fundamental difference in contrast to the following is that t-tests and regression analysis will instead reflect 'average' or 'central tendency' behaviour of the sample airports grouped according to ownership structure.

# CHAPTER 6

# EXTENDED DATA ANALYSIS AND HYPOTHESES TESTING

## 6.1 Descriptive Statistics

In preparation of the t-tests and regression analyses applied for hypotheses testing using the results of PFP, FRA and DEA as dependent variables, the summary statistics for central tendency (arithmetic mean) of the sample airports will be presented.

The 31 individual airports and 4 airport systems considered in this study are a disparate group in terms of traffic throughput and make-up, geographical location, regulatory regimes, operational organization and ownership characteristics. Earlier research indicates that clearer trends can be identified from groups of airports within the same geographic area as opposed to an entire set of European airports (Doganis & Graham 1987; Doganis, Lobbenberg & Graham 1995).

This phenomenon has been reconfirmed in the course of the preceding analysis which revealed similarities for certain groupings. Therefore, the descriptive statistics are not only presented for the total sample but also grouped into eleven additional categories according to 'regional' and 'ownership structure' criteria as described in Tables 6.1 and 6.2 below.

Table 6.1: Airport Groupings for Descriptive Statistics and Further Analyses

| **British Isles** | | **Mainland Europe** | |
|---|---|---|---|
| **UK/Irish** | **BAA** | **German** | **European** |
| BFS | ABZ | **BER Group*** | **ADP Group** |
| BHX | **BAA Group** | CGN | ADR |
| BRS | EDI | DUS* | AMS |
| CWL | GLA | FRA | BRU* |
| EMA | LGW | HAJ | BSL |
| LBA | LHR | HAM | CPH |
| LPL | STN | | GVA |
| LTN* | | | MRS |
| MAN | | | NAP |
| NCL | | | VIE |
| **RIA (AerRianta Group)** | | | ZRH |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 90/91-97/98; Airport systems = **bold**

BAA owned airports and UK/Irish airports constitute the group 'British Isles', while 'Mainland Europe' comprises German and other European airports.

Table 6.2: Airport Groupings According to Ownership Status as of 1999

| **Publicly Owned Airports** | **Privatised Airports** | |
|---|---|---|
| | **Partially Privatised** | **Fully Privatised** |
| **ADP Group** | ADR | ABZ |
| AMS | BHX | **BAA Group** |
| **BER Group*** | BRS | BFS |
| BSL | CPH | BRU (as of 1997)* |
| CGN | HAJ | CWL |
| DUS (as of 1995)* | NAP | EDI |
| FRA | VIE | EMA |
| GVA | | GLA |
| HAM | | LGW |
| LBA | | LHR |
| LTN (as of 1997)* | | LPL |
| MAN | | STN |
| MRS | | |
| NCL | | |
| **RIA (AerRianta Group)** | | |
| ZRH | | |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 90/91-97/98; Airport systems = **bold**

Table 6.2 displays the ownership structure of sample airports as of 1999. It has to be noted that the ownership changes for nine sample airports during the period under consideration, as illustrated by Table 4.2 on the number of fiscal years in public, mixed public-private or fully privatised ownership.

'Airport Systems' includes the four airport groups as per Table 6.3 below.

Table 6.3: Airport Systems

| **British Isles** | | **Mainland Europe** | |
|---|---|---|---|
| **UK/Irish** | **BAA** | **German** | **European** |
| RIA (AerRianta Group) | BAA Group | BER Group* | ADP Group |

*BER Group 1994-1999

All averages calculated for the total sample, the privatised airports, the fully privatised airports, for airports in the British Isles and for the BAA owned airports exclude the BAA Group, in order to avoid double counting.

In the subsequent graphs (Figures 6.1 through 6.28) bars illustrate the arithmetic means, the statistic for central tendency of the descriptive statistics for the different groups of sample airports for the full ten-year period under consideration. The exact values are compiled in Appendix C.1, Descriptive Statistics. The unweighted ten-year group averages imply high validity and reliability, and also smooth peaks regarding extraordinary events as well as the airports' respective position in the investment cycle, whereas the results for individual years may be erratic.

The total sample averages – again unweighted arithmetic means – serve as a point of reference to which groups as per 'geographic' and 'ownership' criteria are compared. Figures 6.1 through 6.28 illustrate the descriptive statistics indicating apparent differences between the eleven groupings as compared to each other and/or the total sample. The figures generally mirror the findings as elaborated on in the course of the analysis of partial factor productivity and financial ratios.

The key below gives the colour codes for the various groupings, i.e. partially privatised and fully privatised airports as well as the combination of both (privatised airports) are in red colour, while publicly owned airports come in light grey, and so on.

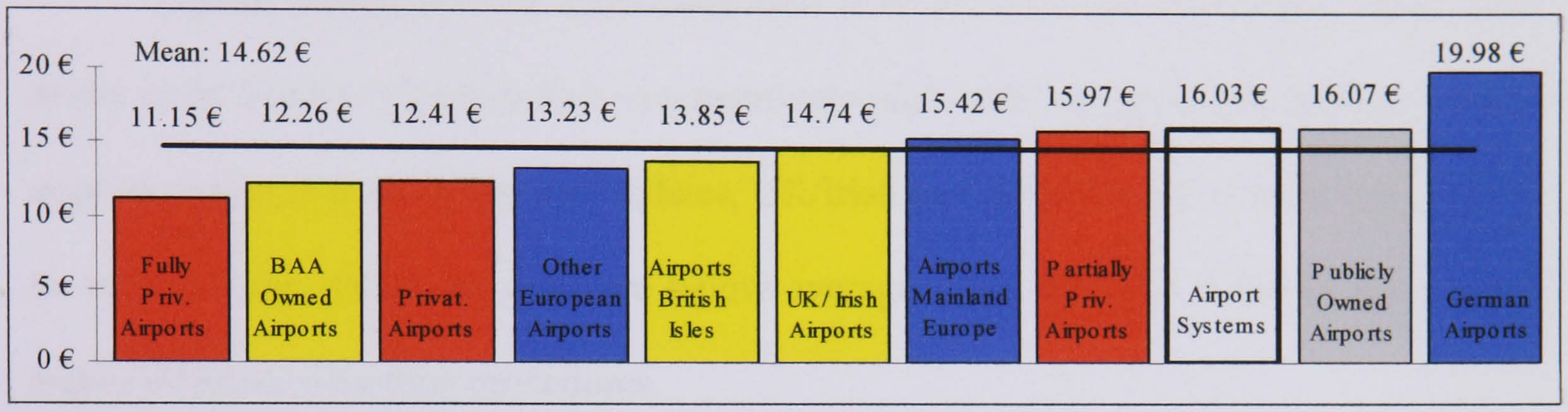
Key to Figures on Descriptive Statistics

| | |
|---|---|
| **Airports in the British Isles**<br>Sub groups: BAA Owned Airports and UK/Irish Airports | **Airports Mainland Europe**<br>Sub groups: German Airports and Other European Airports |
| **Privatised Airports**<br>Sub groups: Partially Privatised and Fully Privatised Airports | **Publicly Owned Airports**<br>Sub groups: none |
| **Airport Systems** | Unweighted Arithmetic Sample Mean/Average |

Figure 6.1 displays the unweighted averages of total cost per WLU in Euro/ECU for the eleven sub groupings for the period 1990-1999, indexed to 1995. The unweighted total sample average or mean – which is excluding the BAA Group in all subsequent

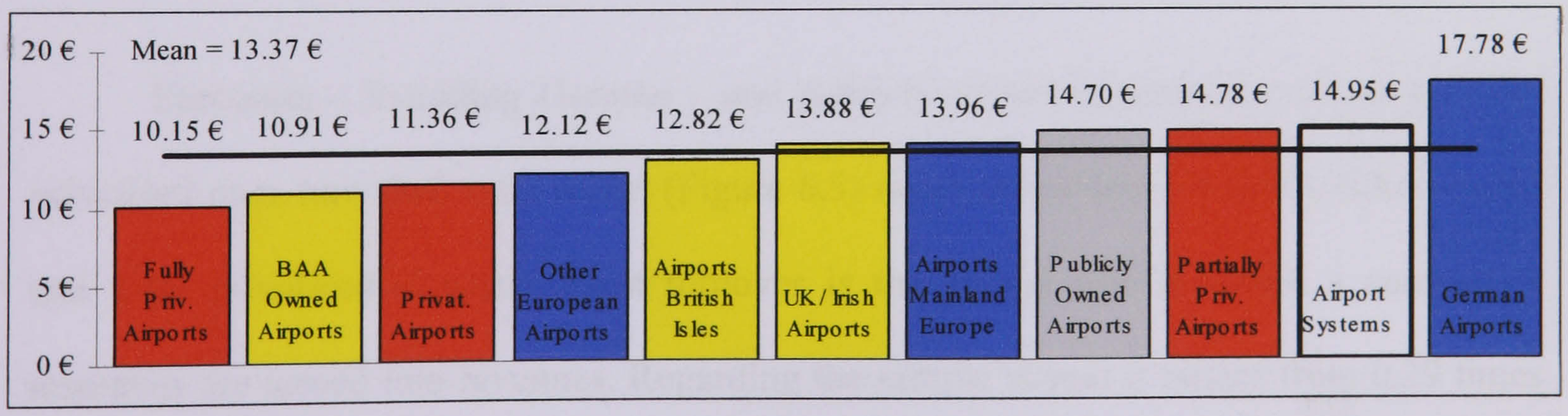
figures to avoid double counting – levels around 15 EUR. German airports are clearly at the high end of the scale, followed by publicly owned ones and airport systems. Airports in the British Isles, other European, BAA owned and fully privatised airports operate below average. Fully privatised airports operate more cost efficient than partially privatised and publicly owned airports.

Figure 6.1: Descriptive Statistics: Long-term Average of Inflation-Adjusted Total Cost per WLU 1990-1999



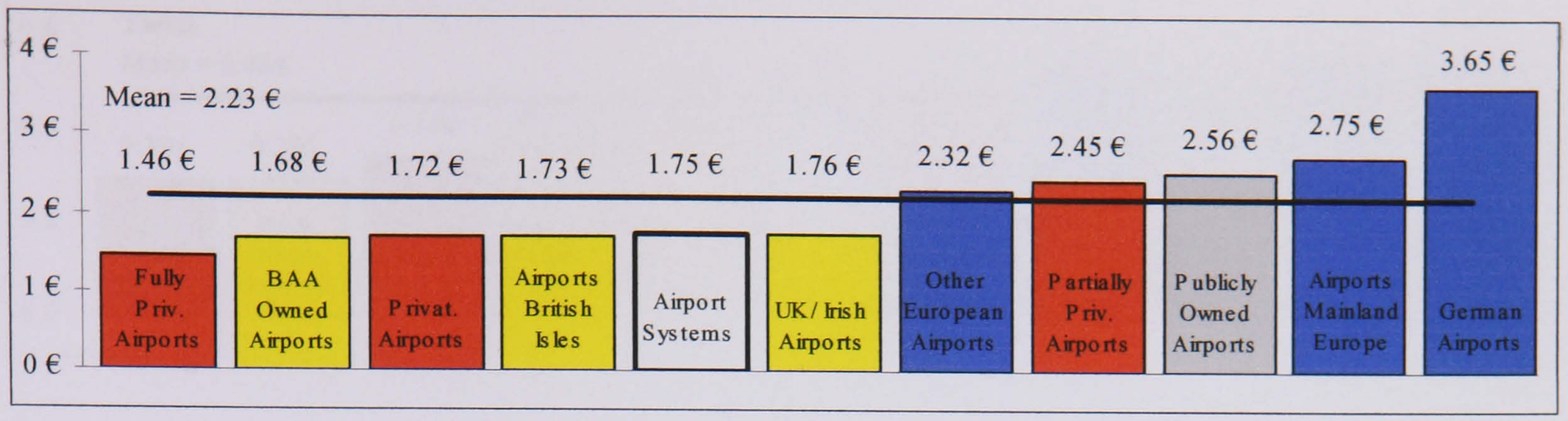

Inflation-adjusted operating unit cost (Figure 6.2) of fully privatised and BAA owned airports are well below average, whereas publicly owned, but also partially privatised and especially German airports are above. In principle, there is not much difference in the ranking regarding operating unit cost as compared to total unit cost.

Figure 6.2: Descriptive Statistics: Long-term Average of Inflation-Adjusted Operating Cost per WLU 1990-1999



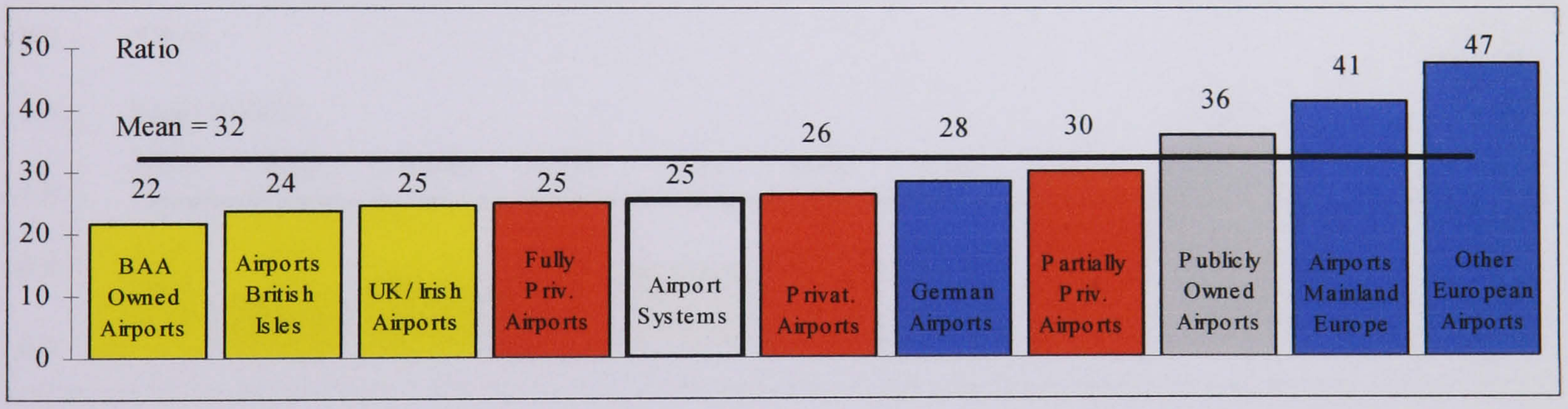

Fully privatised, BAA owned and airports in the British Isles record considerably below average depreciation cost per WLU (Figure 6.3) as opposed to publicly owned, Mainland European and German airports.

Figure 6.3: Descriptive Statistics: Long-term Average of Inflation-Adjusted Depreciation Cost per WLU 1990-1999



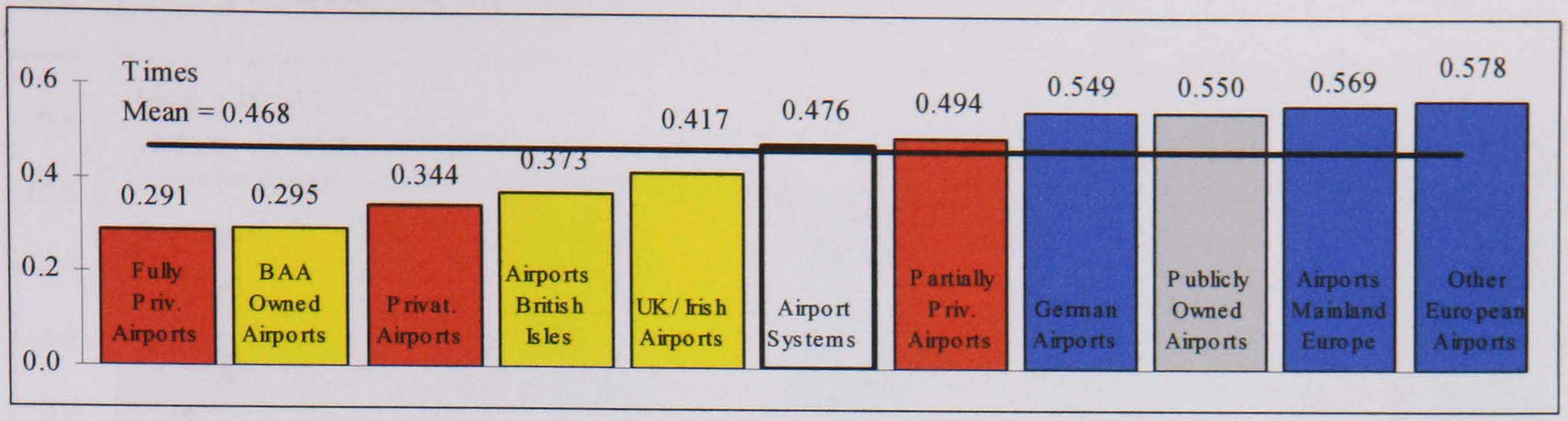

Capital productivity or asset utilization in terms of traffic throughput versus total assets in thousands (Figure 6.4) is comparatively high with European and publicly owned airports, while airports in the British Isles, UK/Irish and BAA owned airports and partially as well as fully privatised ones are below average. This indicates different asset bases and/or different operating procedures.

Figure 6.4: Descriptive Statistics: Long-term Average of Asset Utilization (WLU / Total Assets in '000) 1990-1999



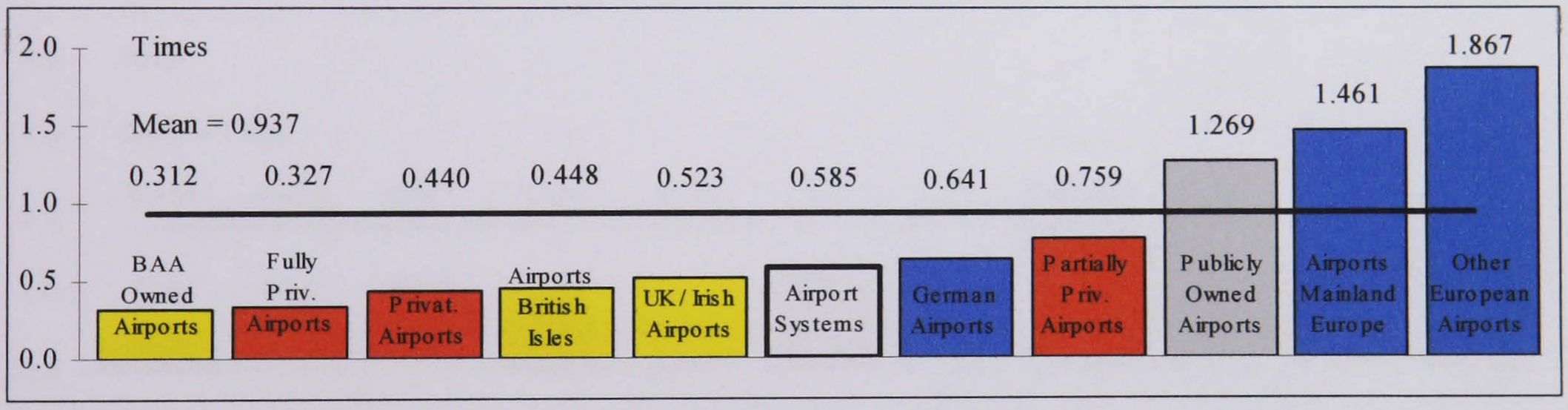

European – including German – and publicly owned airports as well as partially privatised ones turn their total assets (Figure 6.5) much faster than UK/Irish, BAA owned and fully privatised airports. Asset turnover is the annual rate at which a company's resources are turned into revenues. Regarding the sample airport it ranges from 0.29 times with fully privatised airports to 0.58 times as regards the sub grouping 'Other European Airports'. The wide spread of this ratio implies marked differences in the respective volume of total assets and/or total revenue. Moreover, partially privatised and fully privatised airports are quite heterogeneous in this respect.

Figure 6.5: Descriptive Statistics: Long-term Average of Total Asset Turnover 1990-1999




European and publicly owned airports are again fairly dominating with regard to the turnover of fixed assets (Figure 6.6), with considerably higher ratios than for total asset turnover. This implies a comparatively high amount of current assets, whereas all other sub groups appear to be almost exclusively invested in fixed assets. The high ratios of European and publicly owned airports are marginally overstated as a result of the gradual transfer of assets from the respective state authorities to GVA and RIA described earlier.

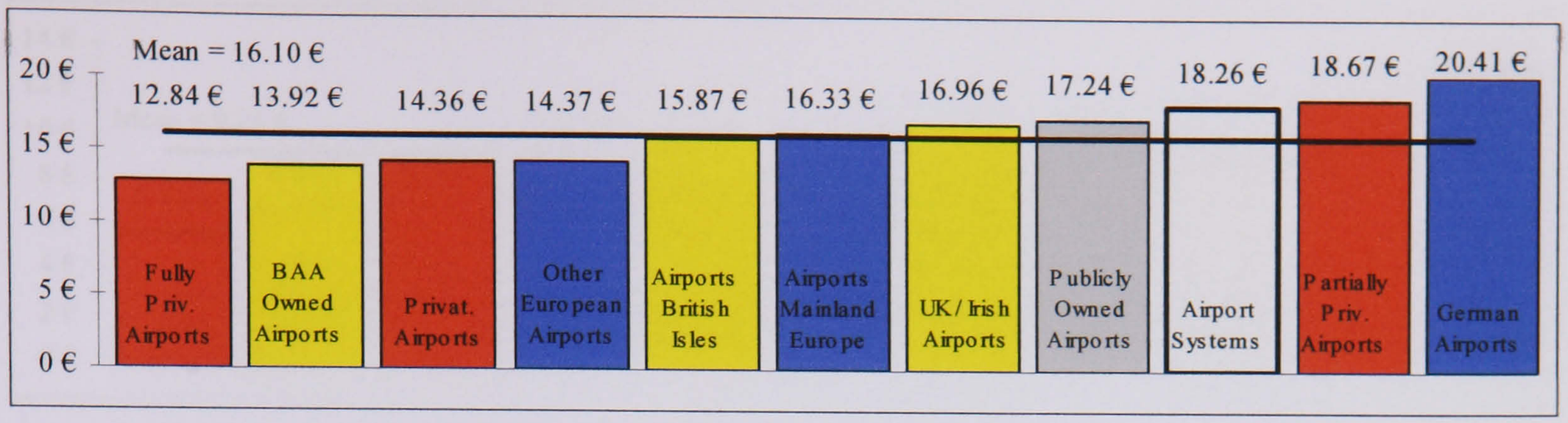
Figure 6.6: Descriptive Statistics: Long-term Average of Fixed Asset Turnover 1990-1999




Both total and fixed asset turnover (Figure 6.5 and 6.6) are also driven by the amount of total revenue. Publicly owned airports and airport systems, but especially partially privatised and German airports, generate considerably more revenue per WLU adjusted for inflation (Figure 6.7) than BAA owned and fully privatised airports.

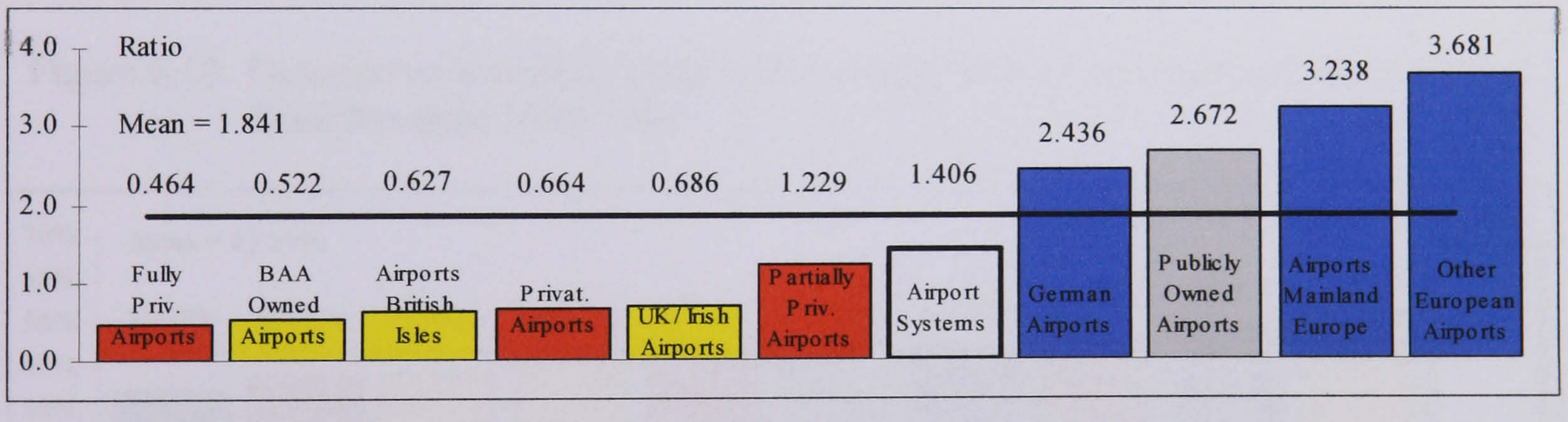
The level of total unit revenues and specifically aeronautical unit revenues (Figure 6.9) may also be partially affected by the prevailing regulatory regime. The application of the single-till concept in the UK tends to result in comparatively lower airport charges, subsidised by revenues from commercial activities.

Figure 6.7: Descriptive Statistics: Long-term Average of Inflation-Adjusted Total Revenue per WLU 1990-1999



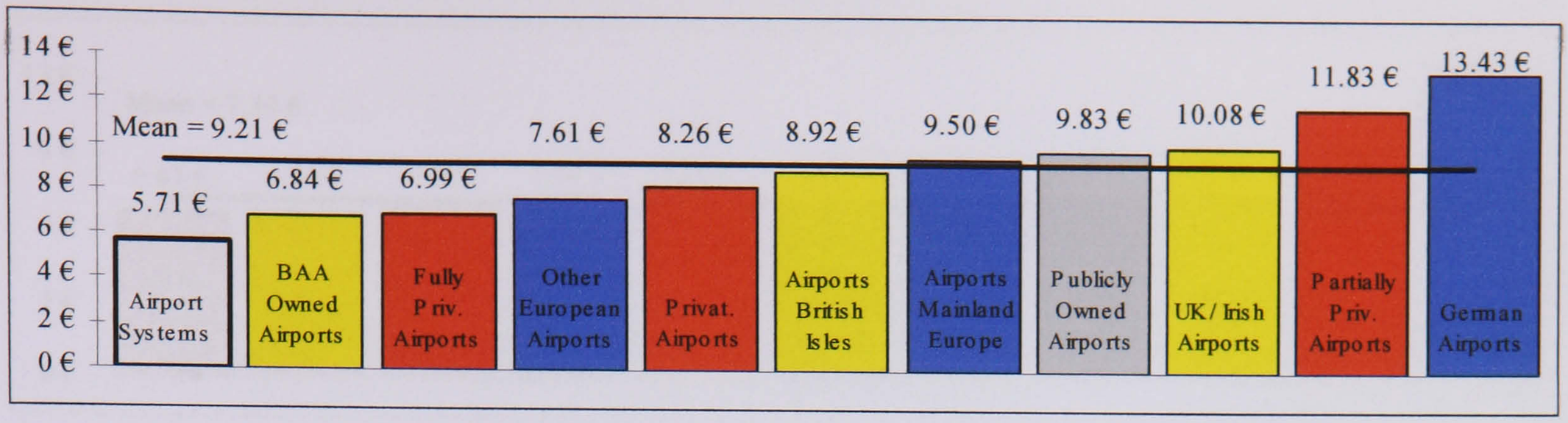

In comparison to the revenue-generation ability as per the unit revenues graph, total revenue per currency unit of shareholders' funds (Figure 6.8) does not only confirm that European and publicly owned airports generate more revenues than their privatised counterparts and those operating in the British Isles. It also indicates relatively different amounts of equity amongst sample airports, magnifying the already disparate picture.

Figure 6.8: Descriptive Statistics: Long-term Average of Total Revenue per Currency Unit of Shareholders' Funds 1990-1999



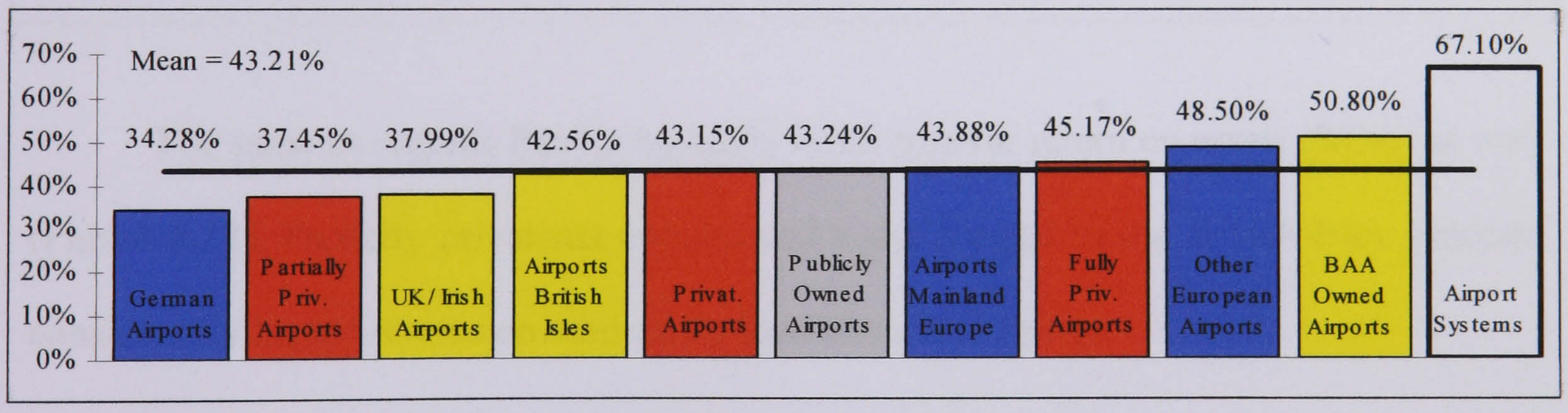

The unweighted ten-year average of aeronautical unit revenues (Figure 6.9) are highest with German and partially privatised airports. These sub groups actually generate more aeronautical revenue per WLU than fully privatised and BAA owned airports. Moreover, partially and fully privatised airports are again quite heterogeneous also in this respect. As commented on above, the different approaches to the economic regulation of airports in the British Isles vs. Mainland Europe may have an impact on aeronautical revenues per WLU in real terms. In the UK, regulation involves a price cap on airport charges adjusted to the retail price index (RPI), in short the RPI (plus/) minus X formula.

Figure 6.9: Descriptive Statistics: Long-term Average of Inflation-Adjusted Aeronautical Revenue per WLU 1990-1999



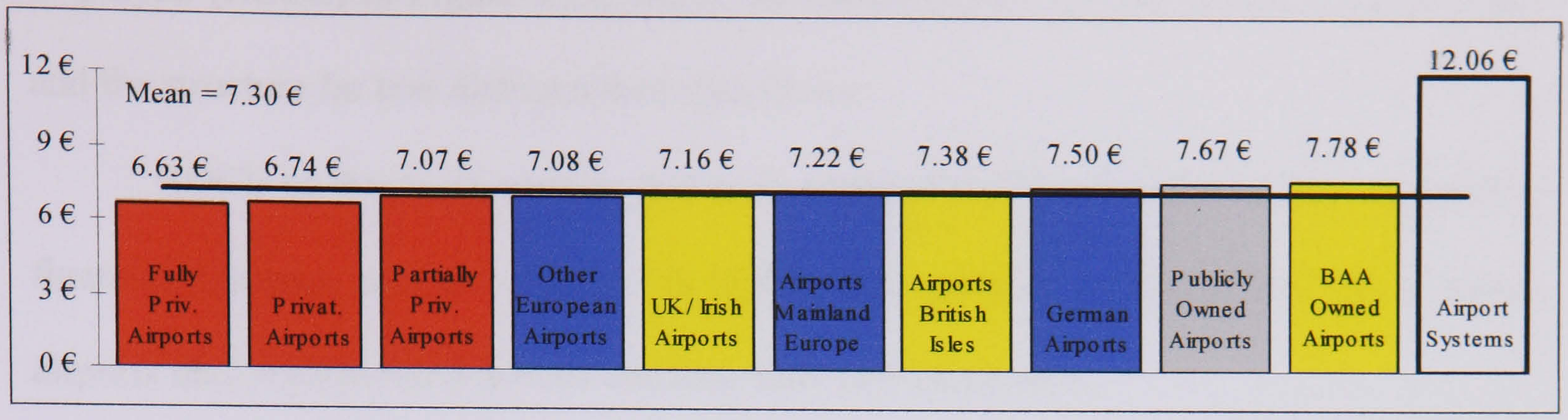

In contrast to total unit revenues, airport systems – two situated in the British Isles and two in Mainland Europe – are ranking lowest in respect of real aeronautical unit revenues. This is primarily due to their focus on commercial activities, which is reflected by their outstanding 67% share of non-aeronautical revenue (Figure 6.10). Especially the BAA Group and the AerRianta Group are driving this ratio with their diversified portfolio. BAA owned, other European and fully privatised airports follow next, still above sample average. German and partially privatised airports range at the lower end of the scale.

Figure 6.10: Descriptive Statistics: Long-term Average of Non-Aeronautical Share of Total Revenue 1990-1999



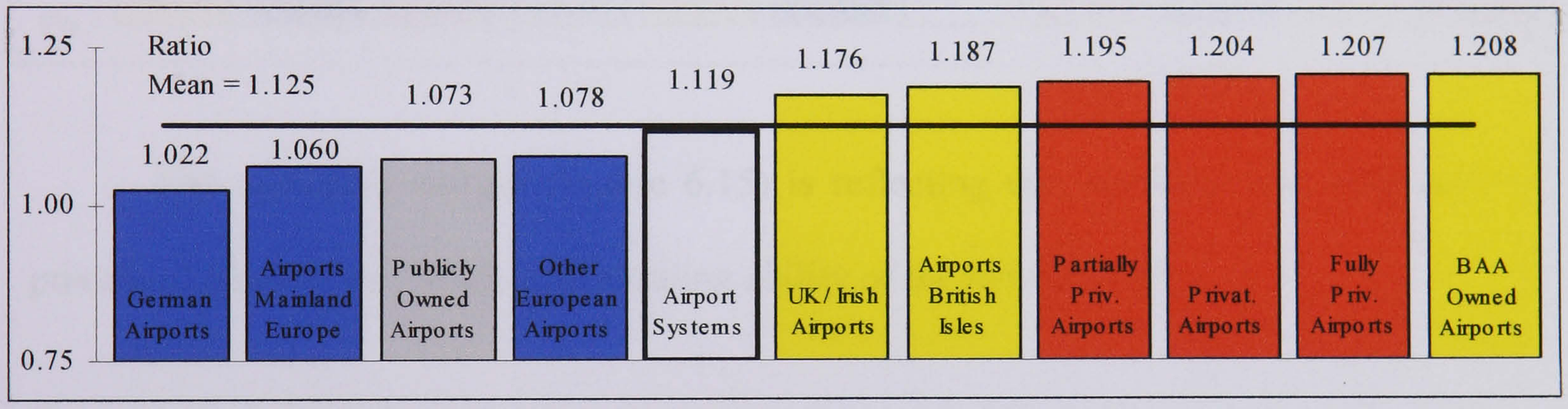

Inflation-adjusted commercial revenue per terminal passenger (Figure 6.11) do not show marked differences amongst sample airports with the exception of airport systems, which is consistent with Figure 6.10 regarding their high share of non-aeronautical revenue. It are again BAA's and RIA's diversified activities – partially abroad – which are causal for the extraordinary high value. All other sub groupings are around sample average, while partially and fully privatised airports rank lowest.

Figure 6.11: Descriptive Statistics: Long-term Average of Inflation-Adjusted Commercial Revenue per Terminal Passenger 1990-1999



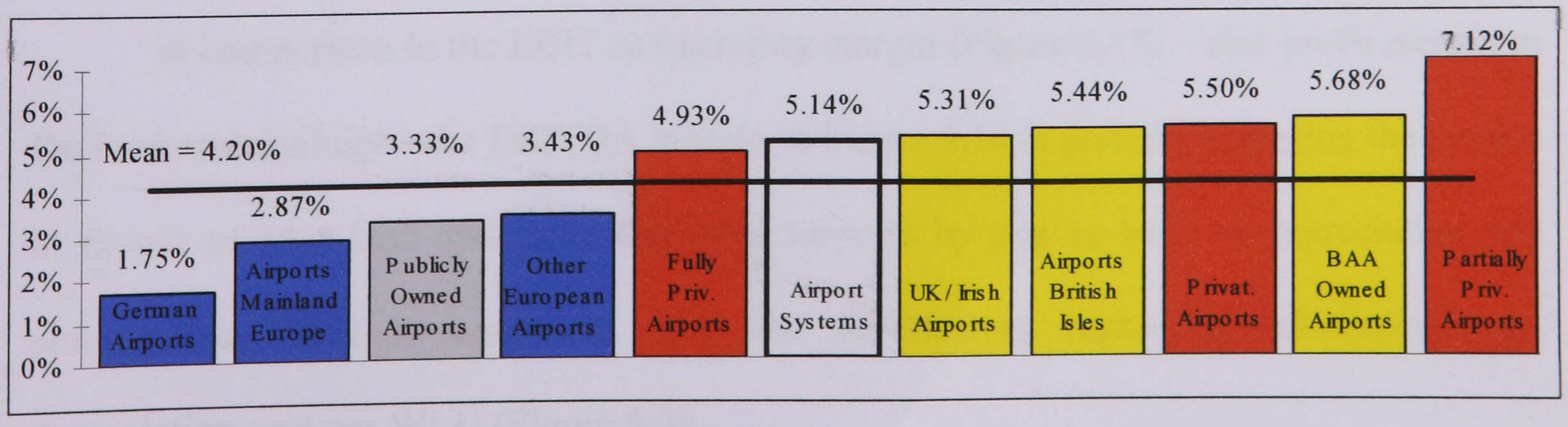

The coverage of total cost by total revenue (Figure 6.12) is highest with BAA owned airports, all three sub groups of partially and fully privatised ones and airports in the British Isles, as opposed to publicly owned, Mainland European and German airports.

Figure 6.12: Descriptive Statistics: Long-term Average of the Revenue / Expenditure Ratio 1990-1999




The same as regards RevEx basically holds true for return on assets (ROA) as well (Figure 6.13). Partially privatised airports and those located in the British Isles generate considerably higher returns on total assets than airports in Europe.

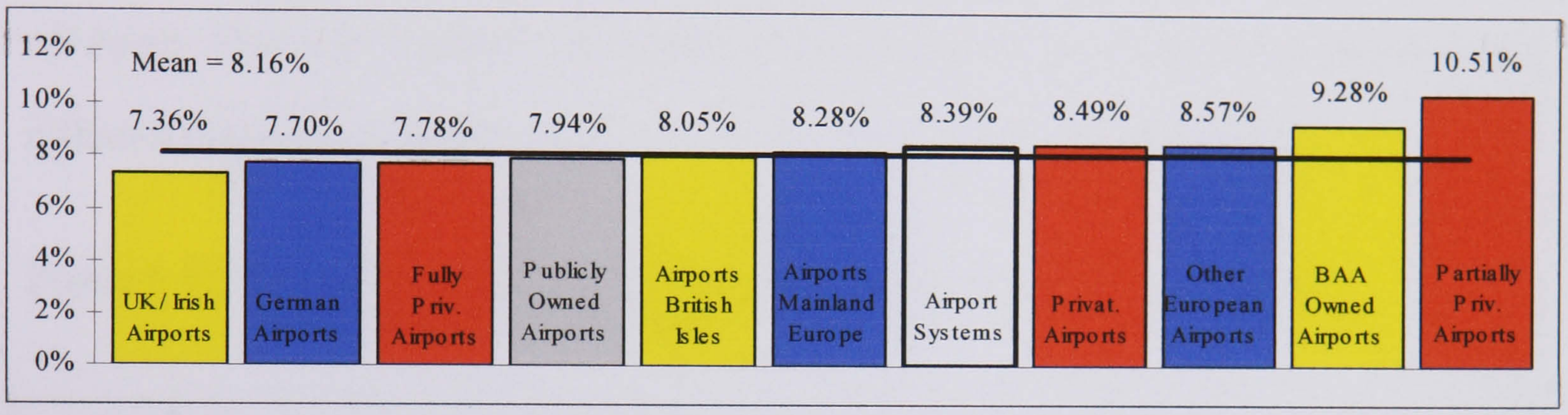
Figure 6.13: Descriptive Statistics: Long-term Average of Return on Total Assets (ROA) 1990-1999



The picture regarding RevEx and ROA changes in respect to return on capital employed (ROCE) in Figure 6.14, where the spread across the sub groups is much lower and the structure far less distinguished than above.

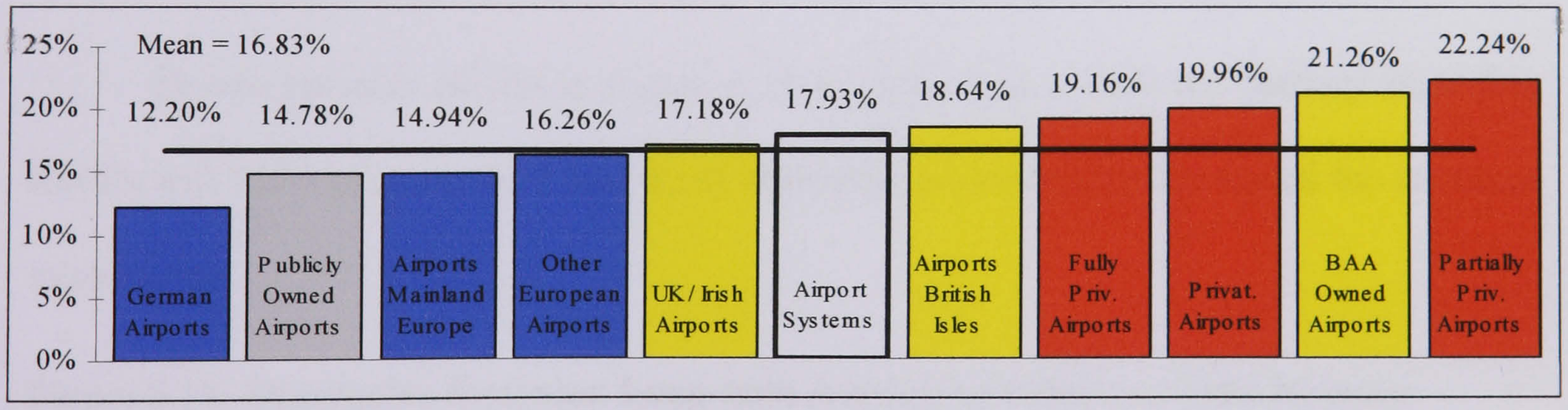
ROCE or the basic earning power in terms of EBIT over total assets – excluding financial leverage and tax effects – is higher with partially privatised and BAA owned airports than with publicly owned and also fully privatised ones.

Figure 6.14: Descriptive Statistics: Long-term Average of Return on Capital Employed (ROCE) 1990-1999



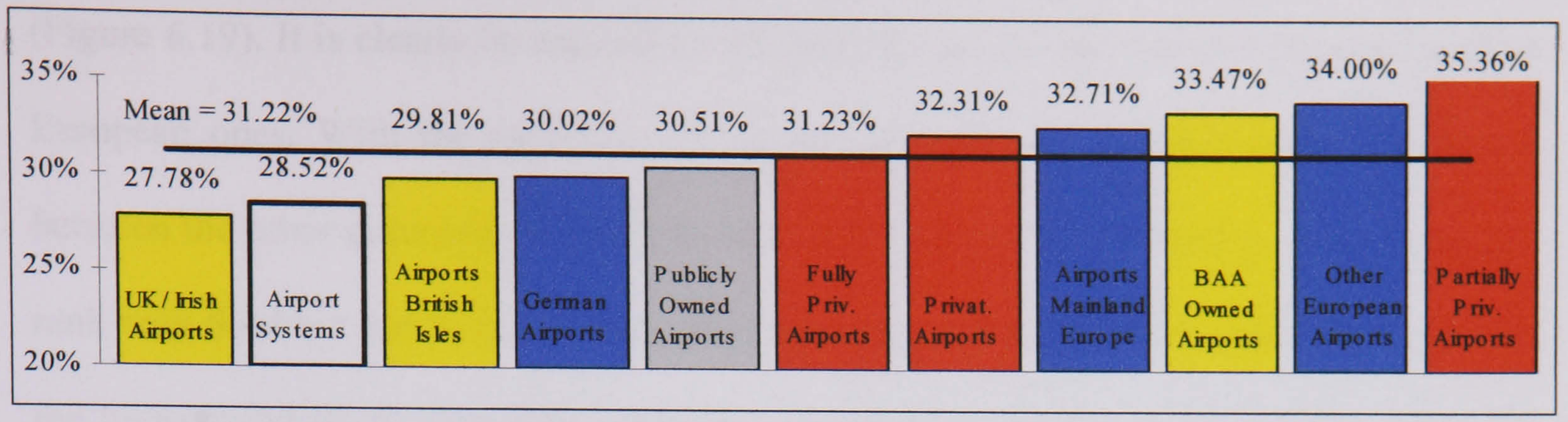

The operating margin (Figure 6.15) is reflecting the increased cost efficiency of privatised airports and revenue-generating ability of the hybrid PPPs.

Figure 6.15: Descriptive Statistics: Long-term Average of Operating Margin 1990-1999



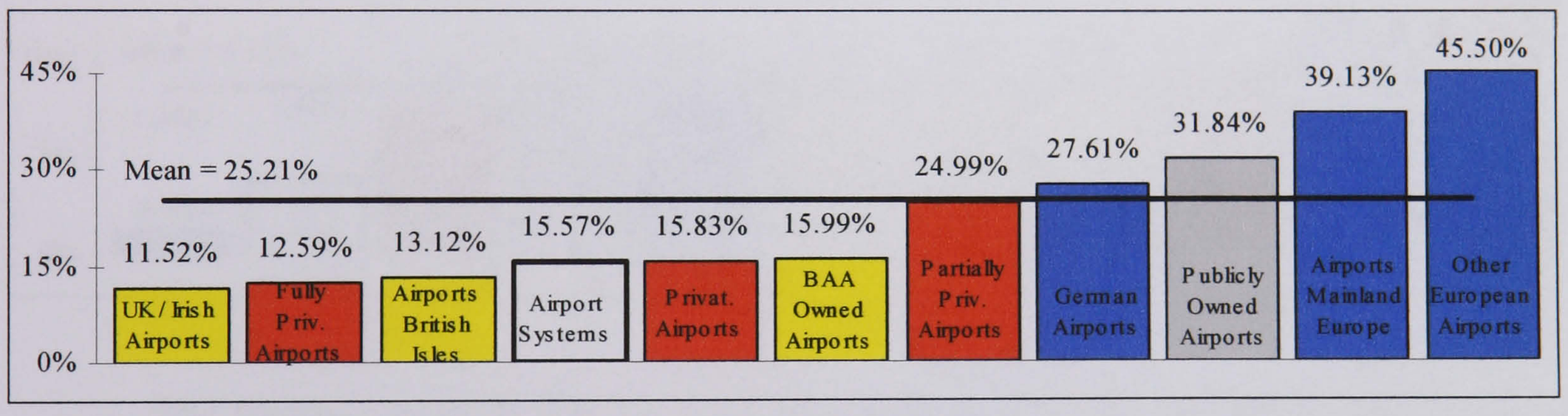

In comparison to the EBIT or operating margin (Figure 6.15) – also profit margin in Du Pont terminology – the EBITDA margin in Figure 6.16 is partially changing the picture in favour of Mainland and other European airports by adding back in depreciation and amortization. This is consistent with the descriptives regarding inflation-adjusted depreciation cost per WLU (Figure 6.3).

Figure 6.16: Descriptive Statistics: Long-term Average of EBITDA Margin 1990-1999



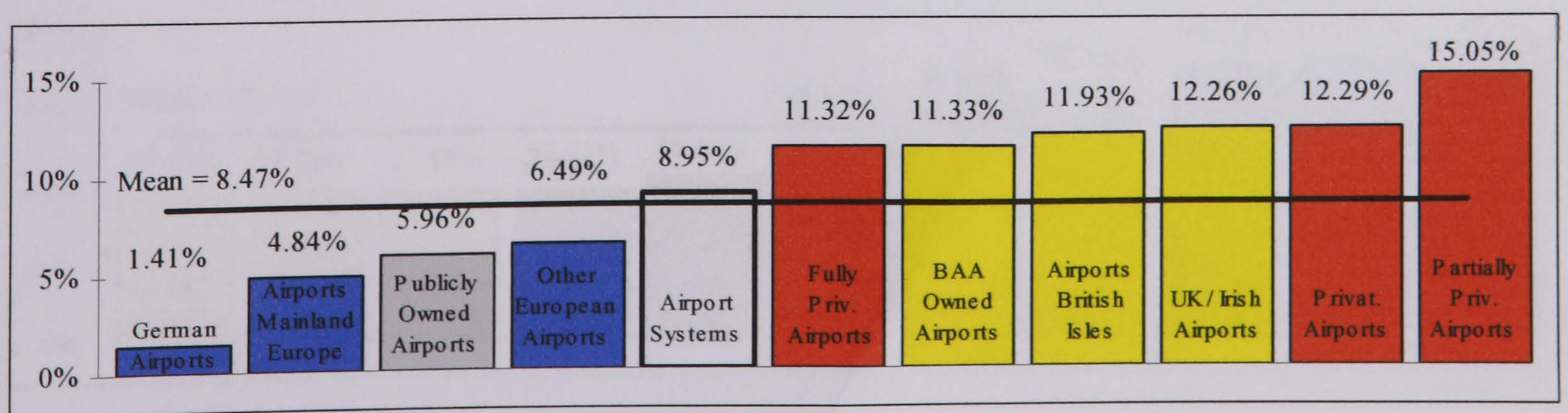

Return on net assets before interest and taxes (Figure 6.17) is dominated by airports across Europe and publicly owned ones, revealing a considerably higher pre-tax return on net assets. This is in contrast to the return rates on assets (ROA, Figure 6.13) and indicates different volumes of equity.

Figure 6.17: Descriptive Statistics: Long-term Average of Return on Net Assets (RONA b.I.a.T.) 1990-1999



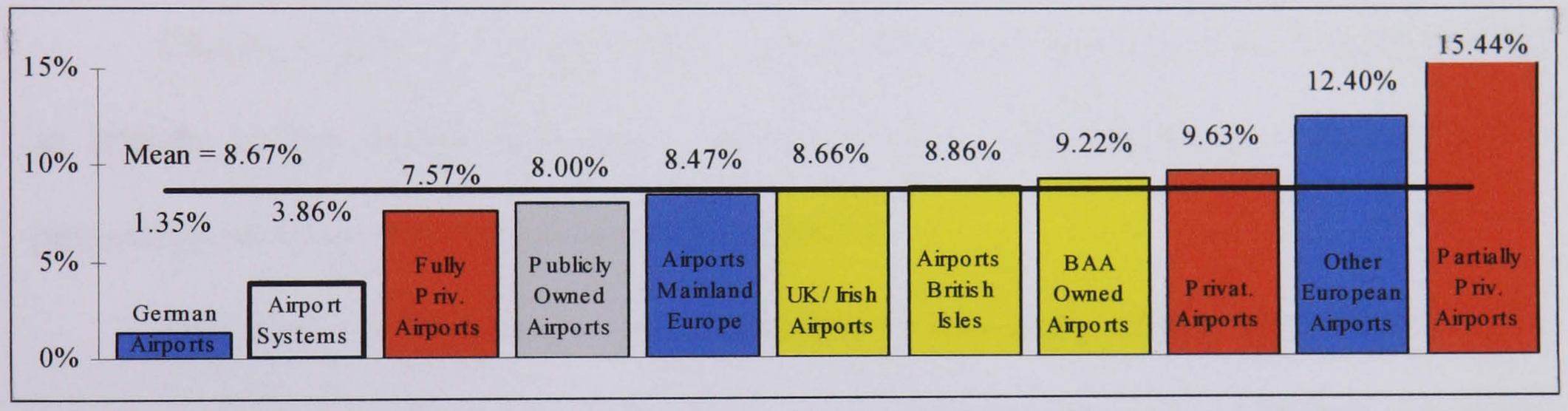

Return on sales (ROS) in Figure 6.18 is again in line with the findings regarding RevEx and ROA (Figures 6.12 and 6.13). Partially privatised airports record the strongest value by far.

Figure 6.18: Descriptive Statistics: Long-term Average of Return on Total Revenue (ROS) 1990-1999



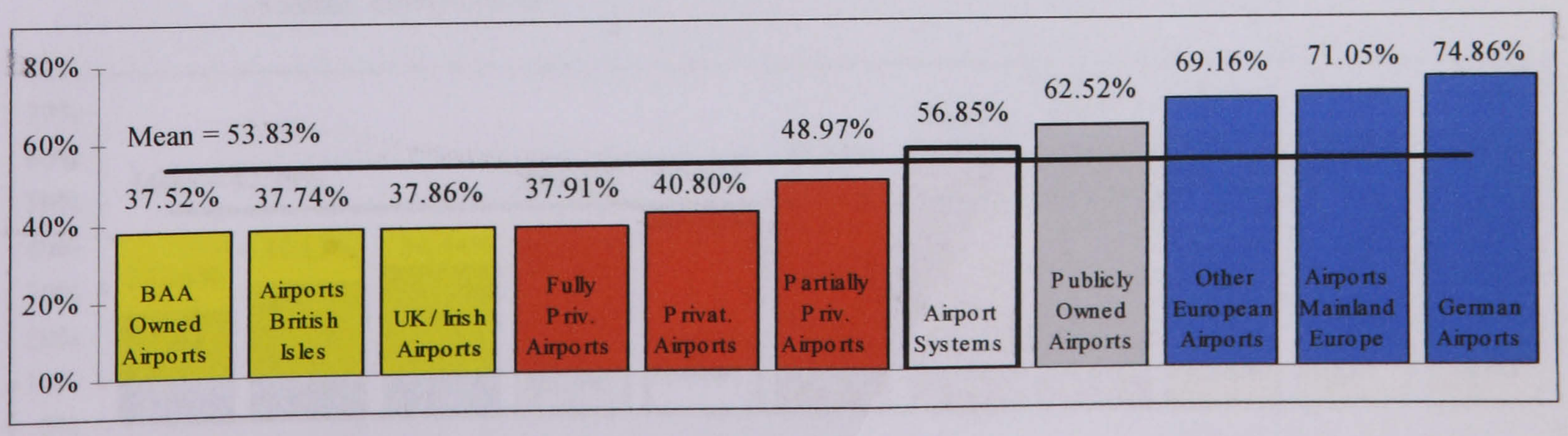
Return on shareholders' funds (ROE) shows a slightly different picture again (Figure 6.19). It is clearly dominated by the partially privatised airports followed by other European ones. With the exception of German airports and airport systems the spread between the other groupings is rather narrow. It is noteworthy that fully privatised airports rank only third but last in this respect, after the sub group of publicly owned ones. Against the background of the descriptive statistics discussed so far it may be concluded that the volume of total assets and their financing via debt and equity or capital structure, and hence financial leverage, appear to have an impact on those group averages – as stated by the Du Pont equation.

Figure 6.19: Descriptive Statistics: Long-term Average of Return on Shareholders' Funds (ROE) 1990-1999



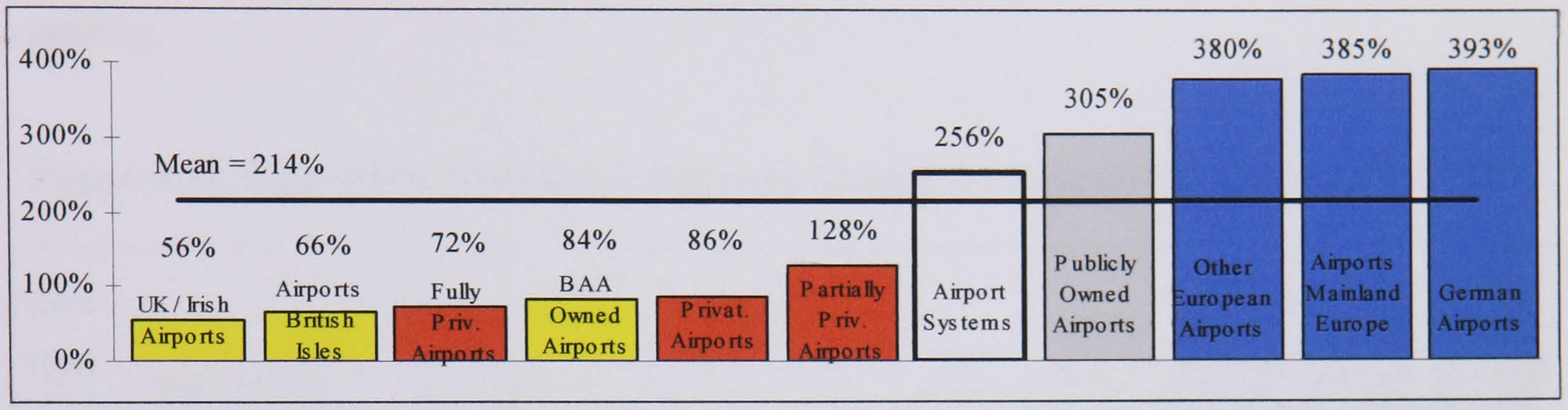

The findings on ROE (Figure 6.19) are confirmed by the debt ratio (Figure 6.20), which shows marked differences amongst the sub groups. German, European and publicly owned airports assume comparatively more debt than their privatised competitors and those operating in the British Isles.

Figure 6.20: Descriptive Statistics: Long-term Average of Debt Ratio 1990-1999



The findings regarding the debt ratio (Figure 6.20) support the debt/equity ratio (Figure 6.21). In principle, gearing (defined as total debt to equity) is mirroring and even reinforcing the descriptives regarding the debt ratio of sample airports. German, European and publicly owned airports are ranking highest again.

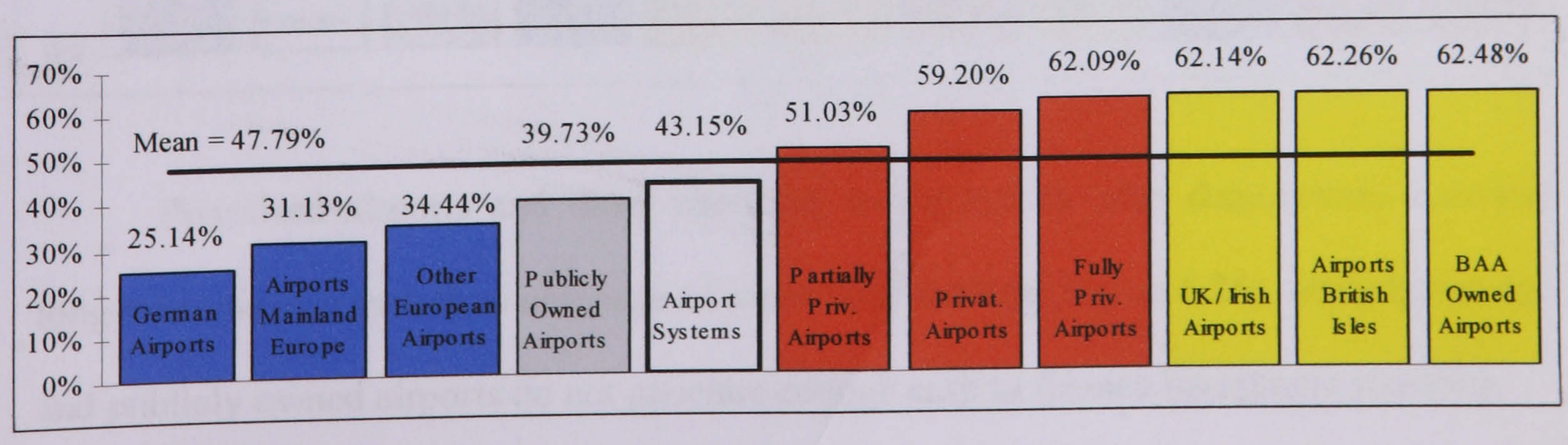
Figure 6.21: Descriptive Statistics: Long-term Average of Gearing (Debt / Equity Ratio) 1990-1999




Gearing (Figure 6.21) also implies that partially and fully privatised airports as well as airports in the British Isles enjoy stronger equity commitments as reflected in the percentage of net assets of total assets (Figure 6.22).

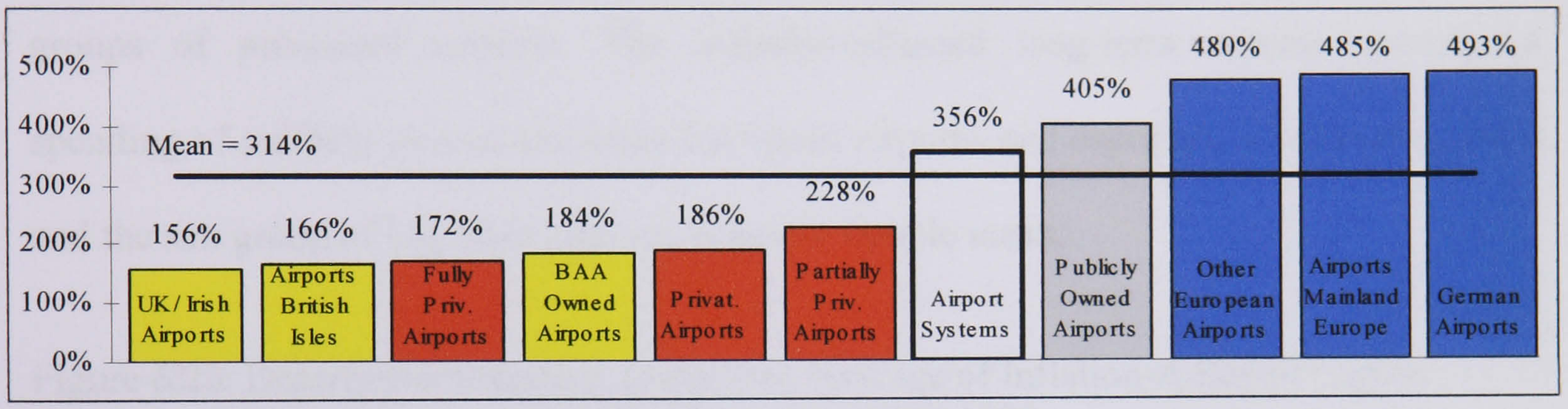
The share of net assets – in the context of this study synonymous for equity – reveals a distinguished capital structure and an opposite approach of British and fully privatised airports versus European and publicly owned airports to financing their productive assets. The equity portion of the latter sub groups is roughly half of British and fully privatised airports' share only. Partially privatised airports appear to assume an intermediate position very close to the total sample mean.

Figure 6.22: Descriptive Statistics: Long-term Average of Net Assets in Percent of Total Assets 1990-1999



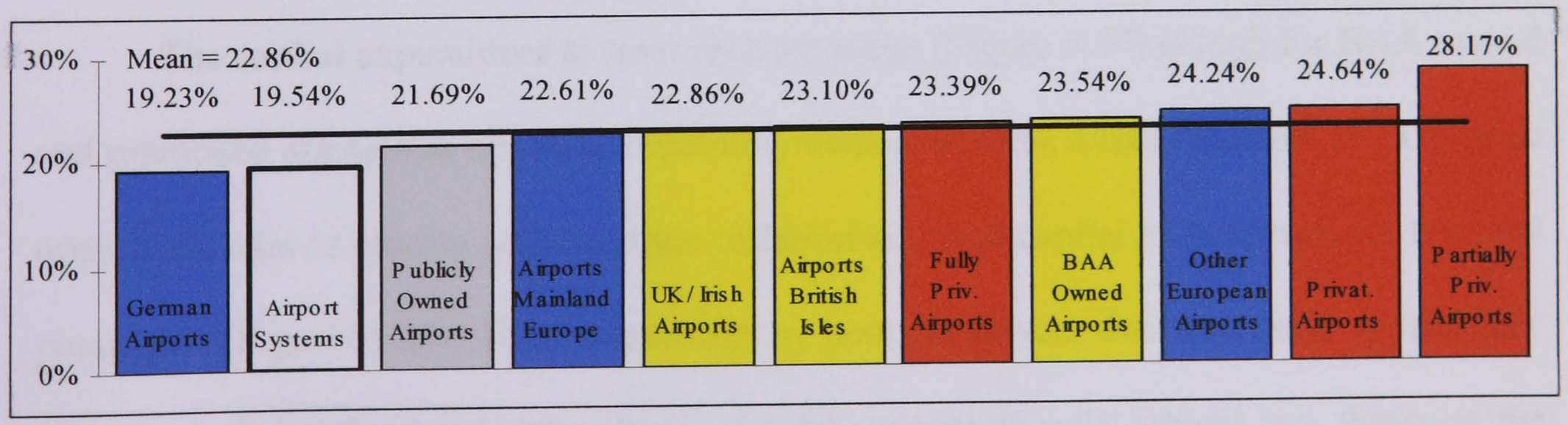
Consistently with Figure 6.22, financial leverage in Figure 6.23 is comparatively low for privatised airports as opposed to European and publicly owned ones, with the 'hybrids' under mixed public-private ownership again relatively close to sample average. Financial leverage is the use of fixed financing costs in terms of interest payments by the company; it is acquired by choice and used as a means of increasing the return to common shareholders. By nature, financial leverage is exactly 100 percentage points higher than gearing.

Figure 6.23: Descriptive Statistics: Long-term Average of Financial Leverage 1990-1999



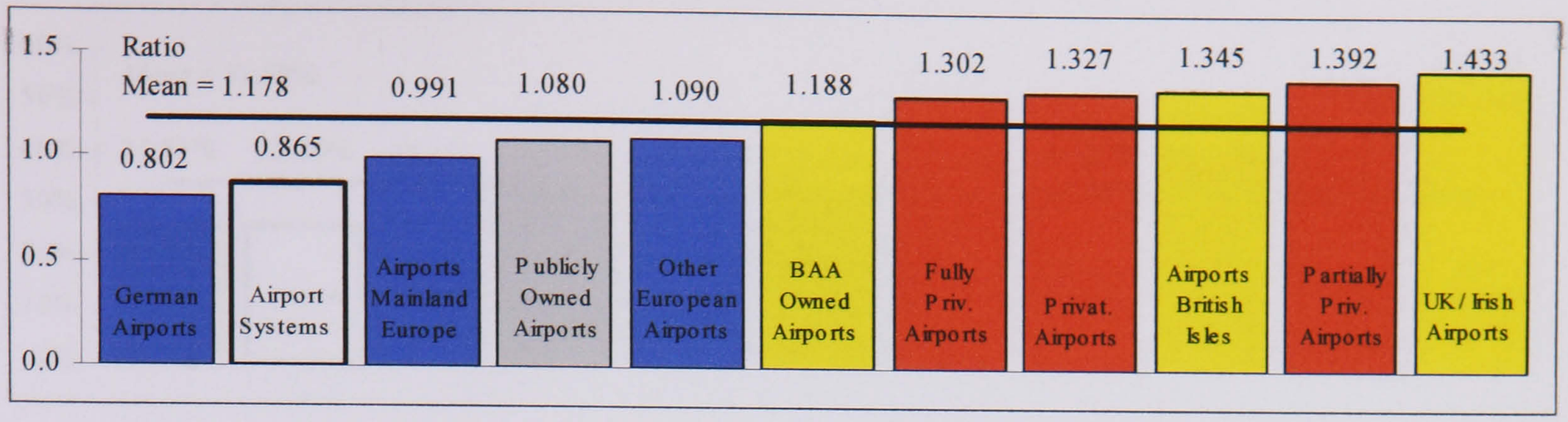

Partially privatised airports generate by far the strongest cash flow as percentage of total revenue (Figure 6.24). Publicly owned airports as well as airport systems and especially German airports do not meet the sample average.

Figure 6.24: Descriptive Statistics: Long-term Average of Cash Flow in Percent of Total Revenue 1990-1999



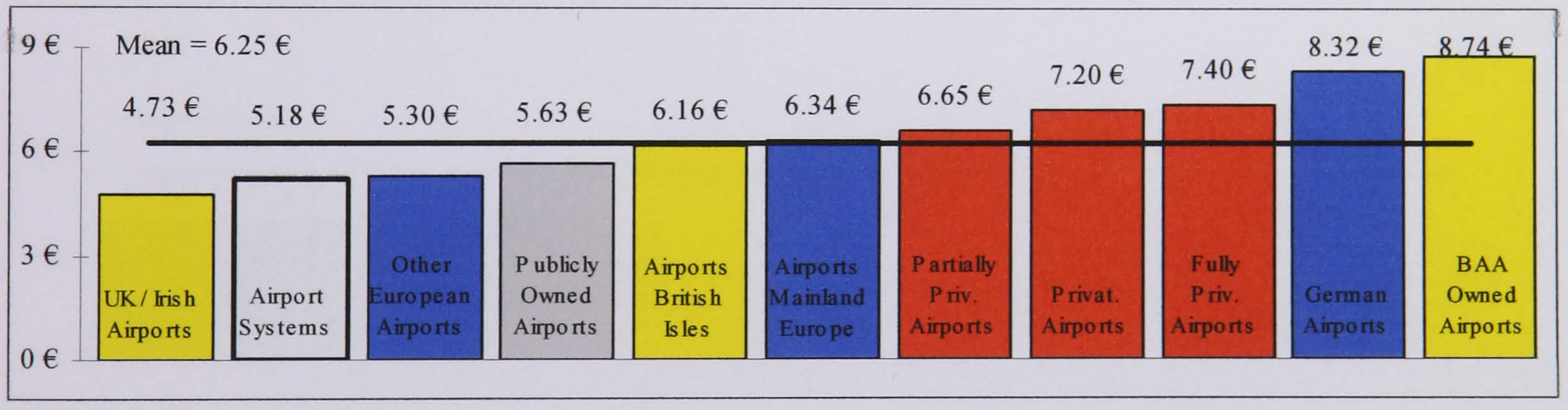

Privatised airports and those operating in the British Isles demonstrate a strong long-term average cash flow coverage of capital expenditure (Figure 6.25), while European and publicly owned airports do not generate enough cash to finance investment spending.

Figure 6.25: Descriptive Statistics: Long-term Average of Investment Coverage Ratio (Cash Flow / Capital Expenditure) 1990-1999



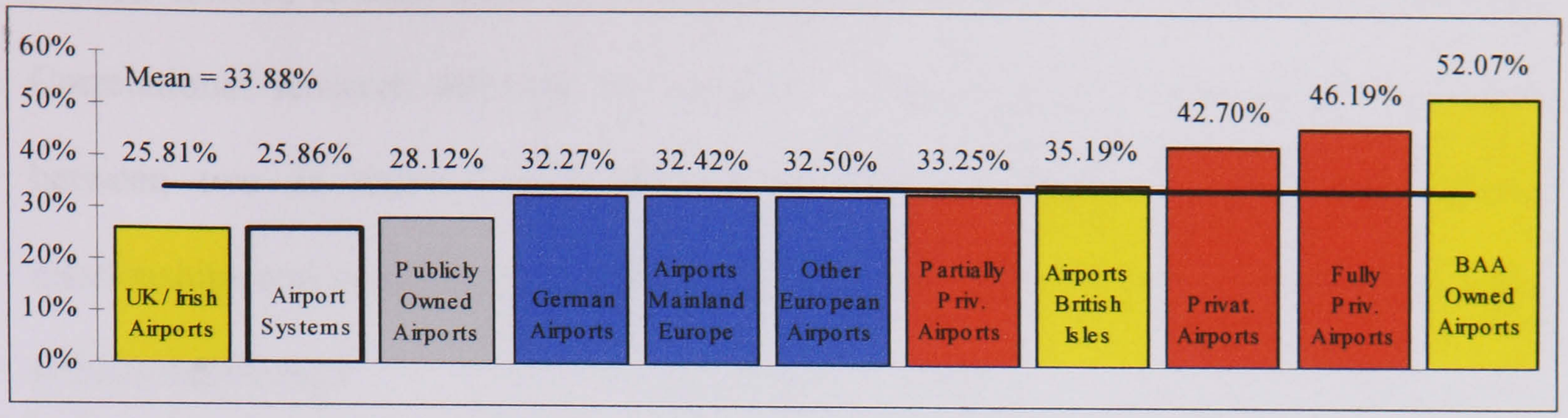

Capital expenditure per terminal passenger indexed to 1995 (Figure 6.26) is highest and well above sample mean with BAA owned and German airports, followed by all sub groups of privatised airports. The inflation-adjusted long-term average investment spending of publicly owned and other European airports, and especially of airport systems and the sub group of UK/Irish airports, is below sample mean.

Figure 6.26: Descriptive Statistics: Long-term Average of Inflation-Adjusted Capital Expenditure per Terminal Passenger 1990-1999



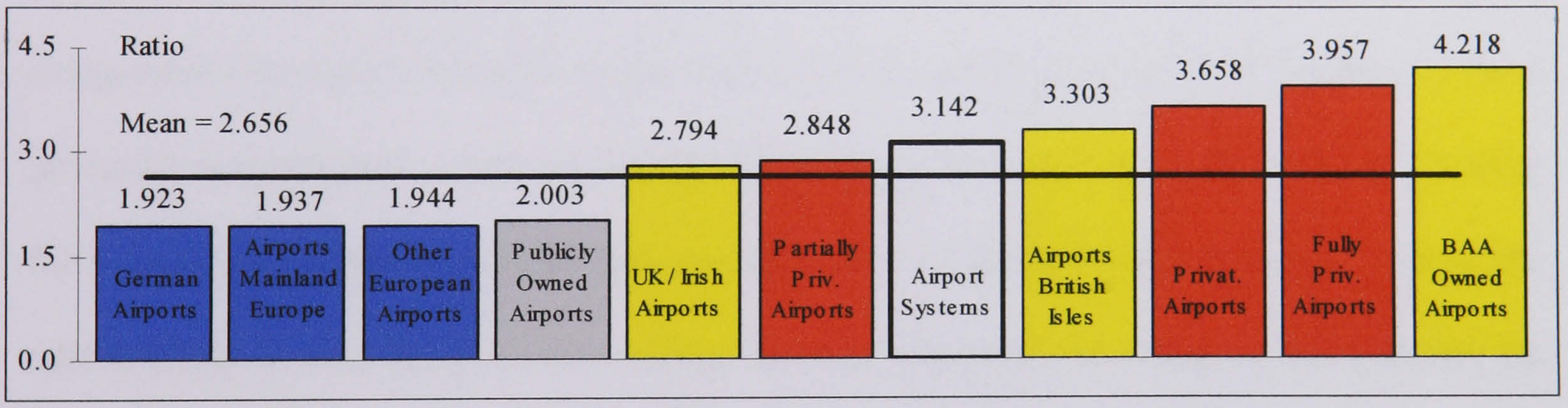

The capital expenditure to total revenue index (Figure 6.27) is high for BAA owned and privatised airports as opposed to publicly owned airports, airport systems and UK/Irish ones. This ratio is closely related to the inflation-adjusted capital expenditure per terminal passenger (Figure 6.26). It is interesting to note, however, that the share of partially privatised airports' capital expenditure of total revenue is only around two thirds of the fully privatised airports' share. This may also be a result of investment obligations under privatisation agreements, which may differ considerably. Furthermore, German airports and airports in the British Isles almost tend to reverse ranks.

Figure 6.27: Descriptive Statistics: Long-term Average of Capital Expenditure in Percent of Total Revenue 1990-1999




Long-term average capital expenditure to depreciation (Figure 6.28) reveals distinct differences between BAA owned airports, privatised airports and those in the British Isles, versus publicly owned and European airports. In all cases, however, investment spending is considerably higher than depreciation, which in turn is by far not sufficient to finance investment.

Figure 6.28: Descriptive Statistics: Long-term Average of Capital Expenditure to Depreciation Ratio 1990-1999




These immediately appealing graphical illustrations of grouped sample data as displayed and discussed in Figures 6.1 through 6.28 shall now be analysed for statistical significance, in order to test the hypotheses stated at the outset.

## 6.2 Regression Analysis and t-Tests

The straightforward review of the performance indicators, indices and ratios shall be taken one step further in applying regression analysis and t-tests for hypotheses testing. Both methods use the results of partial factor productivity (PFP) and financial ratio

analysis (FRA) as variables. DEA scores as overall indices of (in)efficiency of sample airports relative to each other on an annual basis are analysed by regression exclusively. Correlational research attempts to determine whether a significant relationship exists between two or more quantifiable variables. The general purpose is to establish relationships and to use them in making predictions. It does not, however, establish cause-effect relationships.

By nature, correlational research rarely controls the independent variables to measure the effect on a dependent one like in a controlled experiment. Variables are rather measured simultaneously and without strict control. The objective of regression analysis is to determine the values of parameters for a function that cause it to best fit a set of data observations. In the linear regression model, the function is a straight-line equation. This means, the dependent variable, i.e. total cost per WLU is assumed to be a linear function of one or more (in the case of a multiple regression) independent variables, i.e. traffic throughput and/or ownership status. 'Ownership' will be introduced as a qualitative or categorical ('dummy') variable in the course of the subsequent analysis. Regression is a powerful research tool, actually allowing to go one step beyond the collected data. Testing for a linear relationship between two variables in a population is equivalent to testing the null hypothesis that the population slope is zero, which is the same as the test that the population correlation coefficient is zero (Norusis 1996).

The two types of t-test applied to the sample data are designed to compare two experimental conditions or means. Their usage depends on whether the independent variable was manipulated using the same or different subjects. Both have a similar rationale but different designs. The independent samples t-test is designed to test hypotheses about two independent means. This statistical technique tests the null hypothesis that the population mean of a variable is the same for two groups of cases. In addition, it defines a confidence interval for the difference between the population means

of the respective groups. In this between-group design different subjects participate in each condition – in this case different ownership structures. If the null hypothesis is true, the samples have been drawn from the same population and ownership structure does not affect the financial performance in a statistically significant manner. Moreover, the independent samples t-test can accommodate different sample sizes (Field 2000; Norusis 1996).

The dependent-samples t-test, in contrast, is designed to test hypotheses about related means. This procedure tests the null hypothesis that the difference in means of two related variables is zero. It also establishes a confidence interval for the difference between the population means of the two variables. This repeated measures design considers the same subjects in both conditions – in this case airport companies before and after partial or full privatisation. If there is no significant difference between the population means, then the null hypothesis is true and a change in ownership structure has no statistically significant effect on the financial performance of commercial airports (Field 2000; Norusis 1996).

The results of the partial factor productivity and financial ratio analyses will now be examined by applying the above-described procedures in order to investigate the relationships between i.e. unit cost and revenue, debt ratio and financial leverage (dependent variables) and ownership (and – to a minor extent – also regional) characteristics of the sample airports. The descriptive measures 'ownership structure' and 'prior to/after partial or full privatisation' will be used as dummy or grouping variables on which the output index will vary.

## 6.3 Establishing Relationships – Regression Analysis Using 'Ownership' as Dummy Variable

As indicated by the descriptive statistics of the sample airports, differences appear to exist amongst them depending on the formation of sub groups as per ownership structure

and also regional categories. In contrast to other research in the field focusing on the operating performance of individual airports, it is the intention of this study to examine relationships between ownership status and financial performance. It is therefore of paramount interest to investigate differences between sample airports which may be attributable to their respective ownership structure in terms of degree of privatisation. Thus, 'ownership' – publicly owned vs. privatised airports – is being used as a dummy variable. In general, a dummy variable in a (multiple) regression analysis is a qualitative or categorical variable that is used as a predictor. In particular, the variables shown in Table 6.4 are analysed.

Table 6.4: Variables used in Regression Analysis

| **Dependent Variables / Ratios** | **Abbreviation** |
|---|---|
| Total cost per WLU (indexed to 1995) | TCOWLU95 |
| Total asset turnover | TREVTASS |
| Total revenue per WLU (indexed to 1995) | TREWLU95 |
| Revenue/expenditure ratio | REVEX |
| Return on total assets (ROA) | NETPTASS |
| Operating margin | OPMARGIN |
| Return on total revenue (ROS) | ROS |
| Return on shareholders' funds (ROE) | ROE |
| Gearing (debt/equity ratio) | GEARING |
| Cash flow in percent of total revenue | CFTREV |
| **Independent Variable / Predictor** | **Abbreviation** |
| Ownership structure | OWNERSHIP |

The categorical variable 'ownership' is being used as coding or dummy variable and the outcomes or ratios as dependent variables. The independent variable or predictor can only assume two values (0 or 1) for groups 1 and 2, or privatised versus publicly owned airports. Therefore, two different regression equations will result depending on group membership or ownership structure, respectively. In case the group variable equals zero, the residual term of the equation will drop out and the equation will result in the intercept, representing this group's mean. If the group variable equals one, the equation will result in the difference between the group means. Generally speaking, a two-group

design – in this case publicly owned versus privatised airports – can be represented by a regression model in which the intercept is equal to the mean of the group coded as zero (here 'privatised') and the coefficient of the independent variable is equal to the difference between group means. In the course of the subsequent regression analyses the intercept or constant is labelled $b_0$ and the regression coefficient or slope is labelled $b_1$.

The results of the regression analysis reveal that eight out of ten models are statistically valid – with the exception of cash flow in percent of total revenue and return on equity – and that the dummy variable 'ownership' is of statistical significance. The null hypothesis that the dependent variable is not related to the independent or dummy variable 'ownership' is rejected for these eight cases by strong t-values on a 95% confidence level and more than 300 degrees of freedom. The t-statistic is a measure of the statistical significance of the relationship between the dependent and the predictor variable. It may suggest a valid statistical relationship, even though a model might not reveal a particularly high value for the adjusted R squared. While Pearson's correlation coefficient r measures the degree of association, the coefficient of determination $R^2$ measures the proportion of variation in the dependent variable explained by the regression model. The adjusted R squared corrects $R^2$ to more closely reflect the goodness of fit of the model in the population. The test statistics of the regression analysis including graphs are attached in Appendix C.2, Regression Analysis.

As an interim result it is worthwhile to recapitulate that the analysis of sample data reveals strong indications that the ownership status of the airports under consideration appears to be significantly correlated with the outcomes of partial factor productivity indicators and financial ratios. This parallels the results of DEA on total factor productivity, where partially privatised and fully privatised airports consistently achieved higher scores on average than publicly owned ones. Table 6.5 summarizes the main findings of the regression on PFP and FRA results using 'ownership' as predictor.

Table 6.5: Results of Regression Analysis using 'Ownership' as Dummy Variable

| Dependent Variables / Ratios | Ownership Significance | | | Coefficient Sign | |
|---|---|---|---|---|---|
| | highly significant | significant | not significant | positive | negative |
| Total cost per WLU (indexed to 1995) | ◆ | | | | (-) |
| Total asset turnover | ◆ | | | | (-) |
| Total revenue per WLU (indexed to 1995) | ◆ | | | | (-) |
| Revenue/expenditure ratio | ◆ | | | + | |
| Return on total assets (ROA) | ◆ | | | + | |
| Operating margin | | ◈ | | + | |
| Return on total revenue (ROS) | | ◈ | | + | |
| Return on shareholders' funds (ROE) | | | ◇ | + | |
| Gearing (debt/equity ratio) | ◆ | | | | (-) |
| Cash flow in percent of total revenue | | | ◇ | + | |

The results reveal significant or even highly significant correlations for 80% of the analysed variables. In order to investigate whether the financial performance of the sample airports may actually be attributable to their ownership structure and if this is economically and statistically meaningful, an in-depth analysis of the differences between publicly owned and privatised airport companies will be conducted next. The latter group is detailed further into partially and fully privatised sample airports.

## 6.4 Examining Differences – Comparing Group Means

Comparisons of the group means of the individual indices of partial factor productivity and financial ratios will be carried out by way of the above-described independent samples and paired-samples t-tests, in order to analyse whether differences between publicly owned and privatised airports are statistically meaningful. While in regression analysis the t-test has been used to ascertain whether the regression coefficient is equal to zero, a t-test on grouped data investigates whether the difference between group means equals zero.

In particular, the variables in Table 6.6 are applied in both tests. They represent i.e. the cost efficiency, capital productivity, revenue generation, debt and asset management as well as profitability of the sample airports, as tabulated in Appendices B.3 and B.4.

Table 6.6: Variables used in Independent Samples and Paired-Samples t-Test

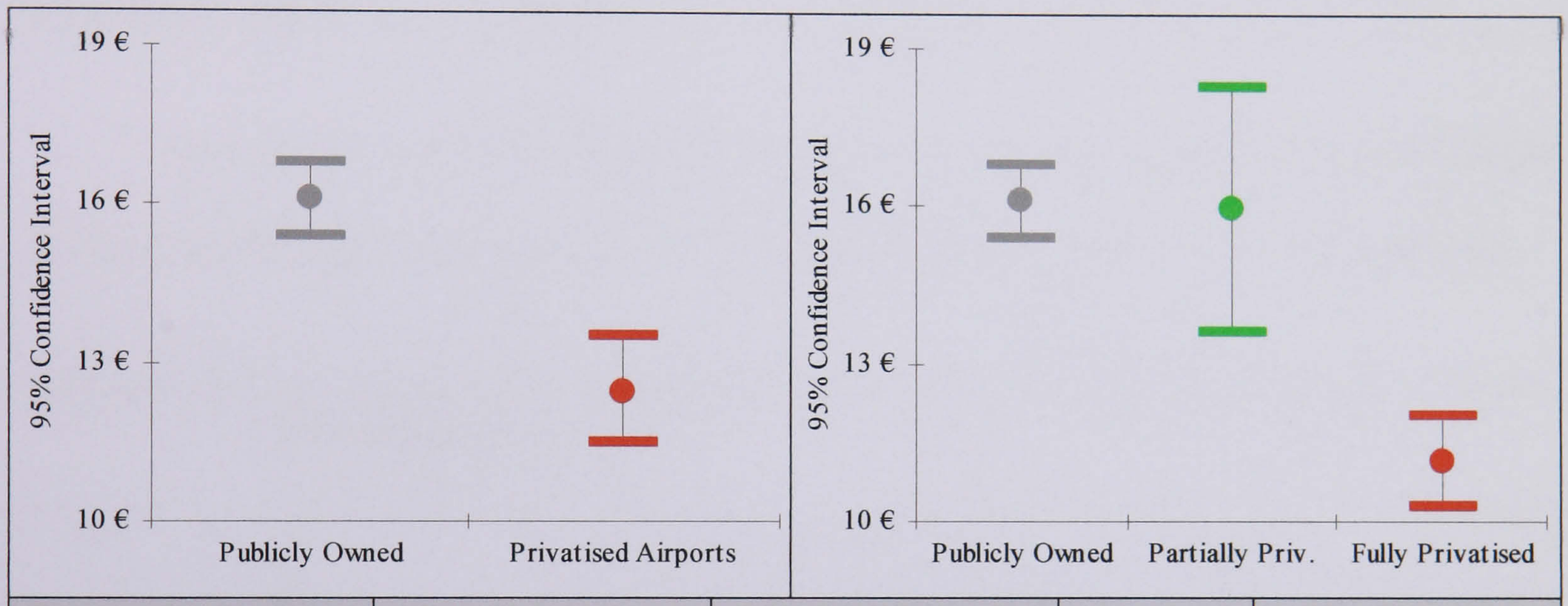
| **Dependent Variables / Ratios** | **Abbreviation** |
|---|---|
| Total cost per WLU (indexed to 1995) | TCOWLU95 |
| Operating cost per WLU (indexed to 1995) | OCOWLU95 |
| Depreciation cost per WLU (indexed to 1995) | DEPWLU95 |
| Asset utilization (WLU/total assets in '000) | WLUTASS |
| Total asset turnover | TREVTASS |
| Fixed asset turnover | FASSTURN |
| Total revenue per WLU (indexed to 1995) | TREWLU95 |
| Aeronautical revenue per WLU (indexed to 1995) | AREWLU95 |
| Non-aeronautical share of total revenue | NASHTREV |
| Commercial revenue per terminal passenger (indexed to 1995) | CREPAX95 |
| Revenue/expenditure ratio (RevEx) | REVEX |
| Return on total assets (ROA) | NETPTASS |
| Return on capital employed (ROCE) | ROCE |
| Operating margin | OPMARGIN |
| EBITDA margin | EBITDAMA |
| Return on net assets (RONA b.I.a.T.) | RONABIAT |
| Return on total revenue (ROS) | ROS |
| Return on shareholders' funds (ROE) | ROE |
| Net assets in percent of total assets | NASSTASS |
| Debt ratio | DEBTRATI |
| Gearing (debt/equity ratio) | GEARING |
| Financial leverage | FINLEVER |
| Cash flow in percent of total revenue | CFTREV |
| Investment coverage ratio (cash flow/capital expenditure) | CFCAPEX |
| Total revenue per currency unit of shareholders' funds | TREVSHF |
| Capital expenditure per terminal passenger (indexed to 1995) | CAPPAX95 |
| Capital expenditure in percent of total revenue | CAPTREV |
| Capital expenditure to depreciation ratio | CAPEXDEP |
| **Categorical Variables / Predictors** | **Abbreviation** |
| Ownership structure 1<br>(Publicly owned vs. privatised airports) | OWNER 1 |
| Ownership structure 2<br>(Publicly owned vs. partially privatised vs. fully privatised) | OWNER 2 |
| Geographical location 1<br>(British Isles vs. Mainland Europe) | REGION 1 |
| Geographical location 2<br>(UK/Irish vs. BAA owned vs. other European vs. German) | REGION 2 |
| Prior to/after partial or full privatisation | BEFAFTER |

### 6.4.1 Between-Group Design: Independent Samples t-Test

The results of the independent samples t-test reveal statistically significant or even highly significant differences between privatised and publicly owned airports for 20 out of 28 ratios, rejecting the respective null hypotheses by strong t-values on a 95% confidence

level. This is illustrated by the related error bar graphs (Figures 6.29-6.56), specifying the differences for 95% confidence intervals. The footers below the individual graphs always present the standard deviation of the respective values as a summary statistic for data variability and the mean difference between the ten-year averages of publicly owned versus privatised airports. A high t-value and significance value below 0.0500 show that there is a significant difference between the two group means. The full test statistics of the independent samples t-test are attached in Appendix C.3, Independent Samples t-test.

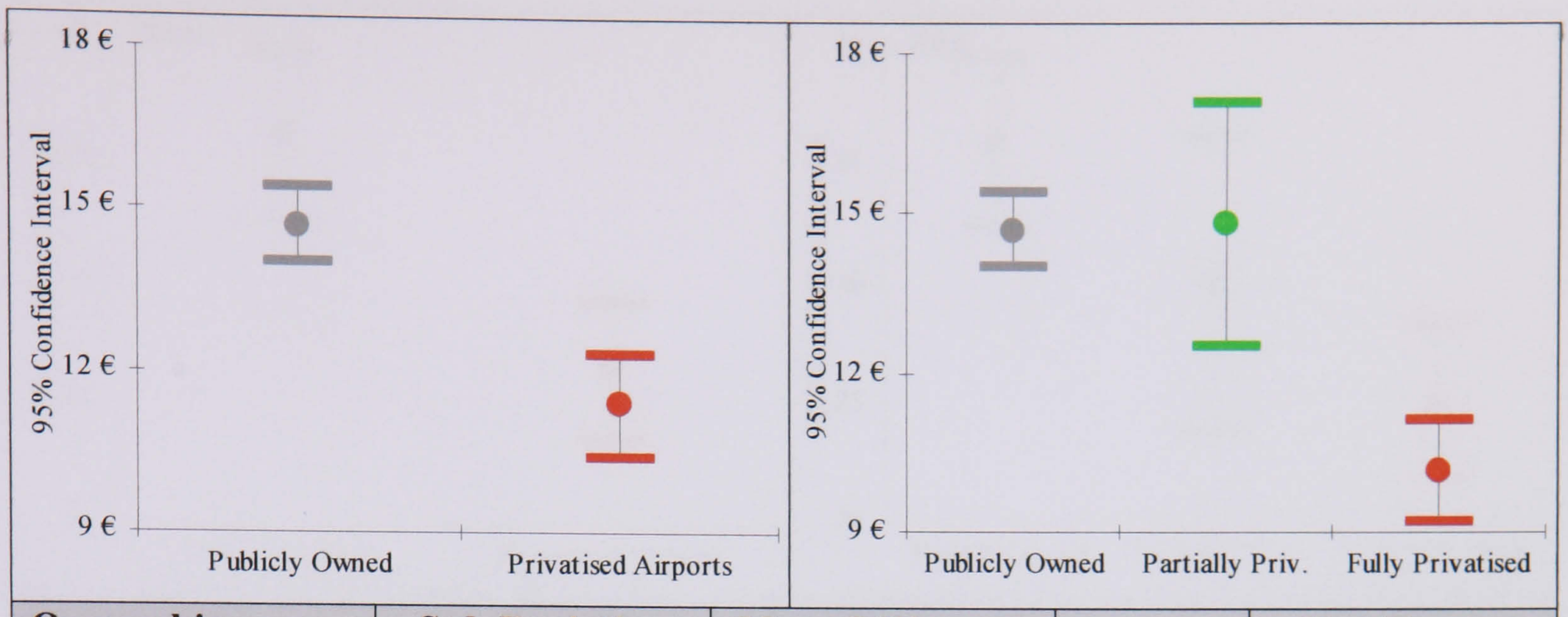
Figure 6.29: Error Bar Graphs of Inflation-Adjusted Total Cost per WLU 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 5.0977 € | 3.66 € | 6.243 | .000 |
| Privatised Airports | 5.3339 € | | | |

The difference in inflation-adjusted total unit cost (Figure 6.29) of publicly owned and privatised airports is highly significant. The analysis of sample data in the course of PFP, FRA and DEA also suggested different characteristics of partially privatised versus fully privatised airports. Therefore, a supplementary breakdown of the two latter sub groupings is displayed in the right-hand portion of all subsequent error bar graphs on the independent t-test results. Detailing further in addition to the primary comparison of publicly owned and privatised airports reveals that the significant difference in real unit cost is primarily caused by the rather low unit cost of fully privatised sample airports.

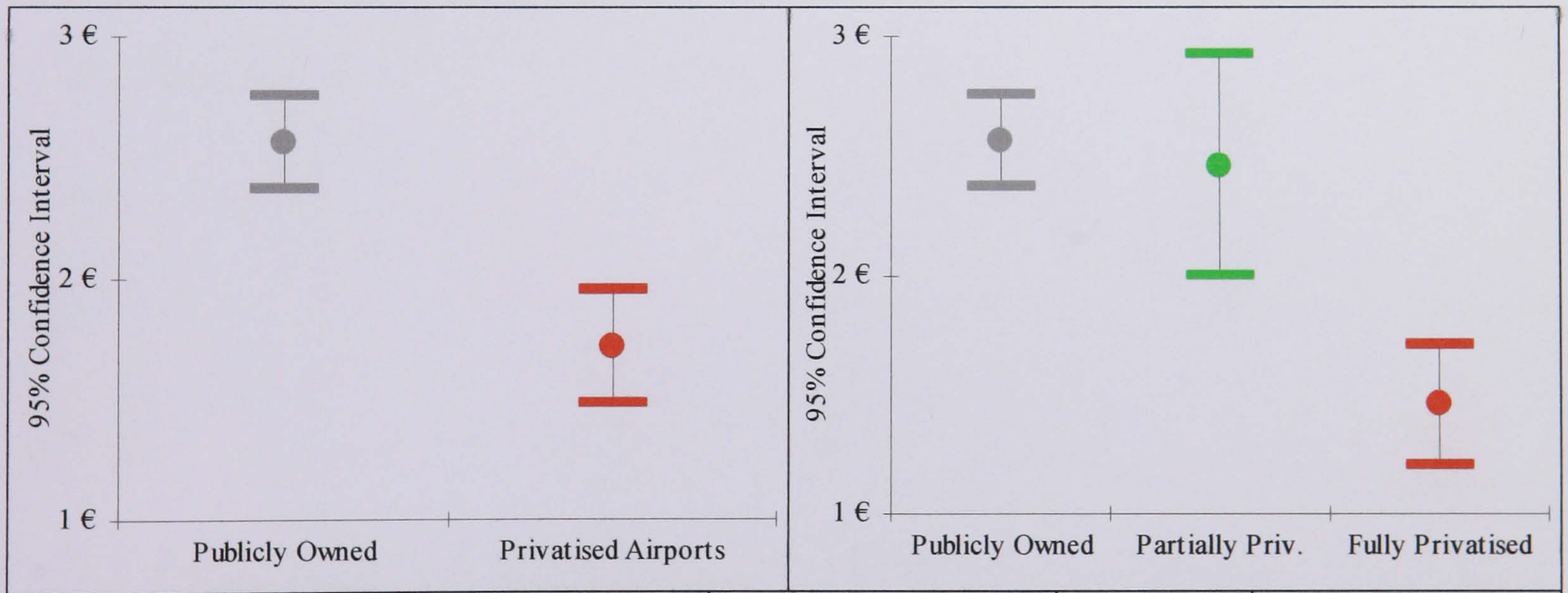
Figure 6.30: Error Bar Graphs of Inflation-Adjusted Operating Cost per WLU 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 4.8779 €<br>5.6017 € | 3.33 € | 5.701 | .000 |

The same as regards Figure 6.29 also holds true for real operating unit cost (Figure 6.30). The difference between publicly owned and privatised airports is highly significant.

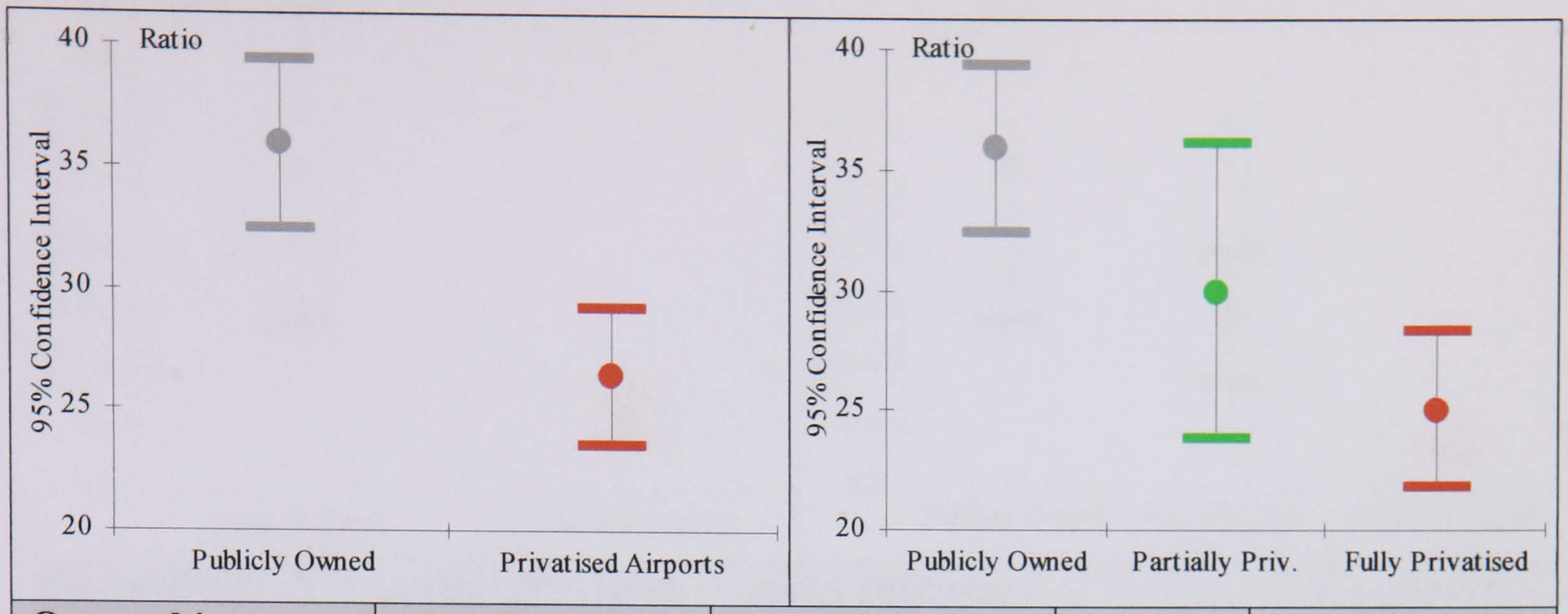
Figure 6.31: Error Bar Graphs of Inflation-Adjusted Depreciation Cost per WLU 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 1.3417 €<br>1.3441 € | .85 € | 5.581 | .000 |

Real depreciation cost per WLU (Figure 6.31) differs highly significantly. Similar to operating unit cost (Figure 6.30), the means of publicly and partially privatised airports are rather close as opposed to the considerably lower average of fully privatised ones.

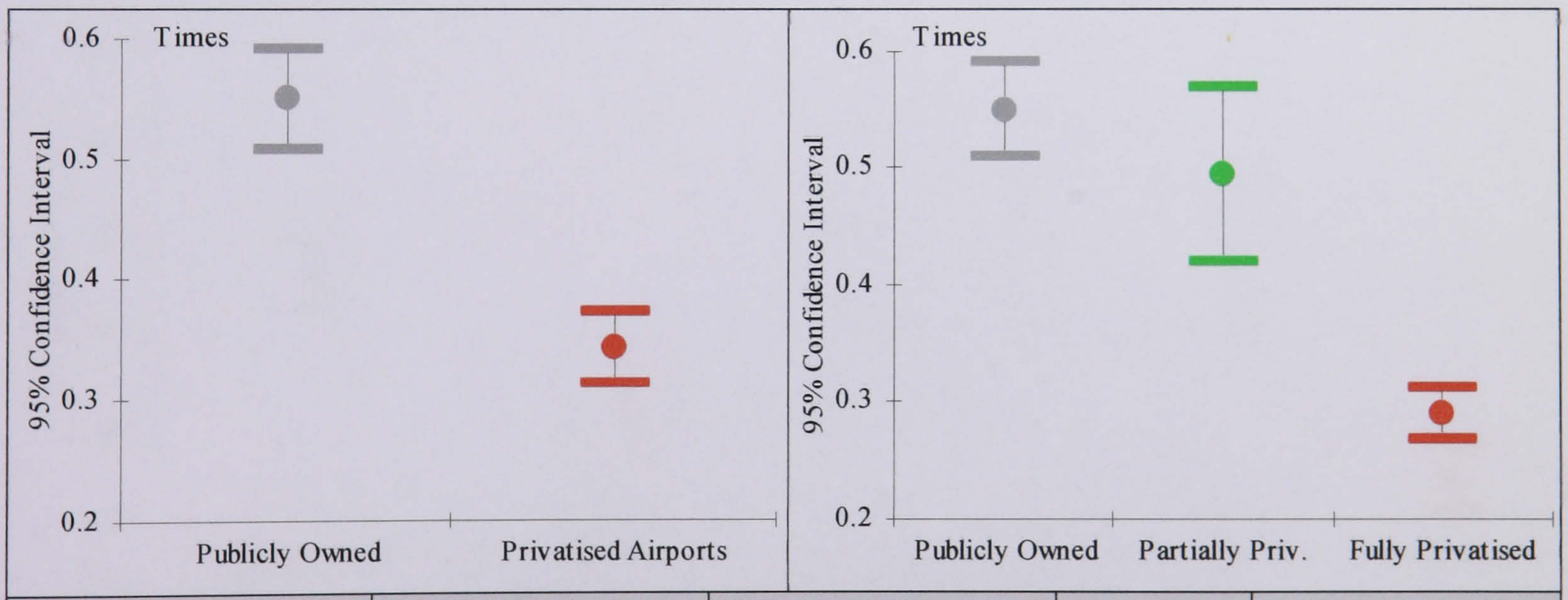
Figure 6.32: Error Bar Graphs of Asset Utilization (WLU / Total Assets in '000) 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 24.7847<br>16.5405 | 9.527 | 3.847 | .000 |

The difference in asset utilization (Figure 6.32) is highly significant between publicly owned and privatised airports. Both partially and fully privatised airports reveal considerably lower values than publicly owned ones.

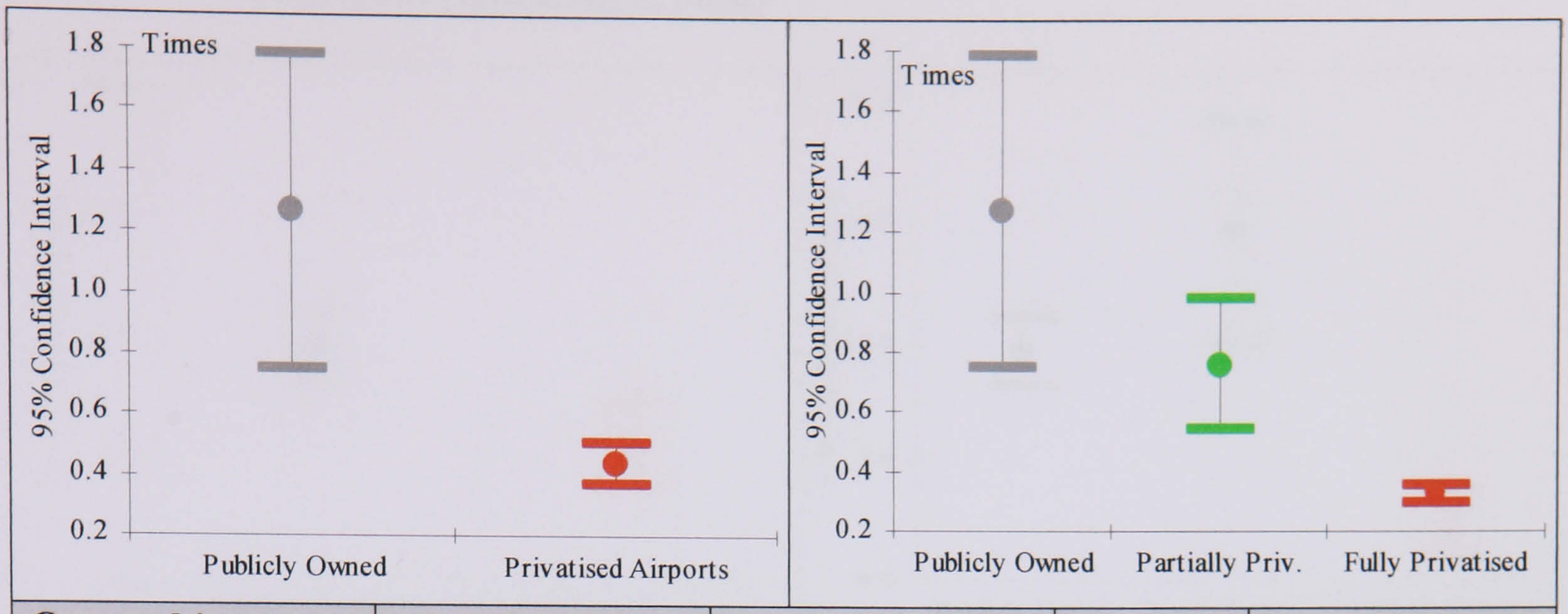
Figure 6.33: Error Bar Graphs of Total Asset Turnover 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | .2958<br>.1709 | 0.206 | 7.195 | .000 |

The means of total asset turnover (Figure 6.33) of publicly owned and privatised airports differ highly significantly. The difference between partially and fully privatised sample airports is striking. Privatised airports are clearly not a homogeneous group.

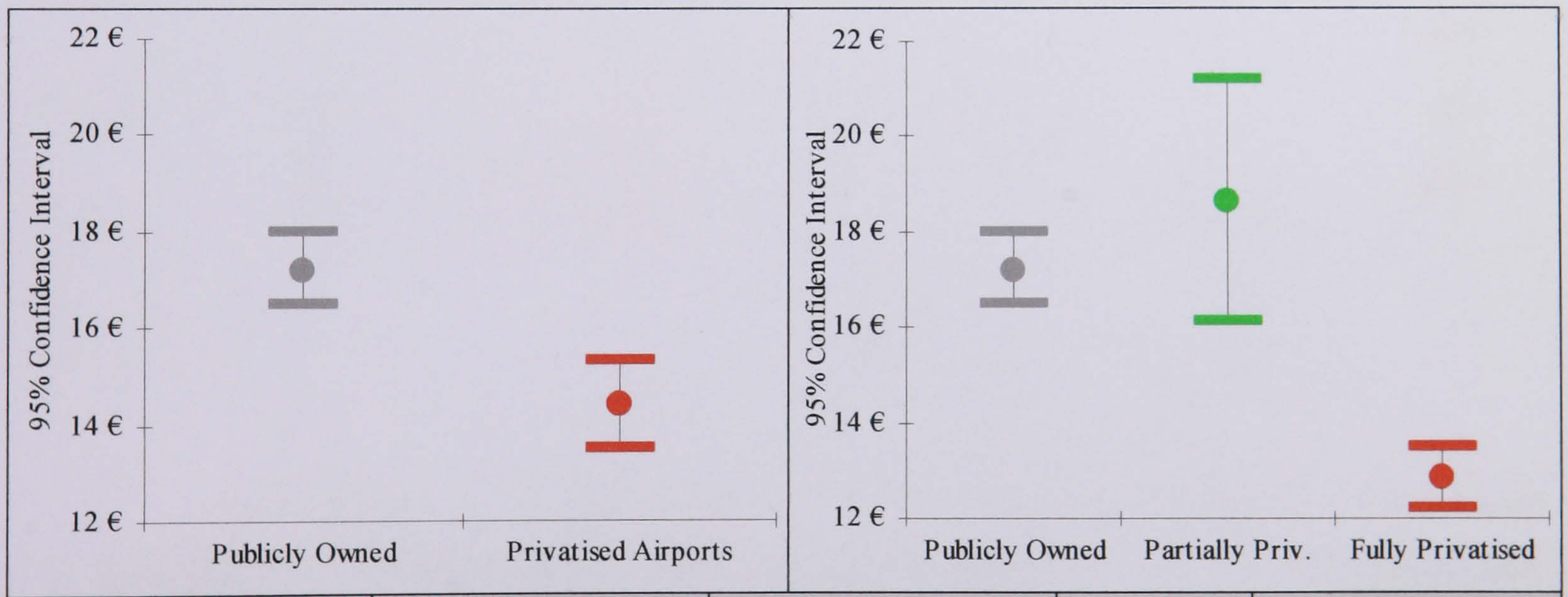
Figure 6.34: Error Bar Graphs of Fixed Asset Turnover 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 3.6692 | .829 | 2.565 | .011 |
| Privatised Airports | .3878 | | | |

There is also a significant difference in fixed asset turnover (Figure 6.34). The standard deviation of publicly owned airports is rather wide as opposed to privatised ones. Partially privatised airports assume an intermediate position.

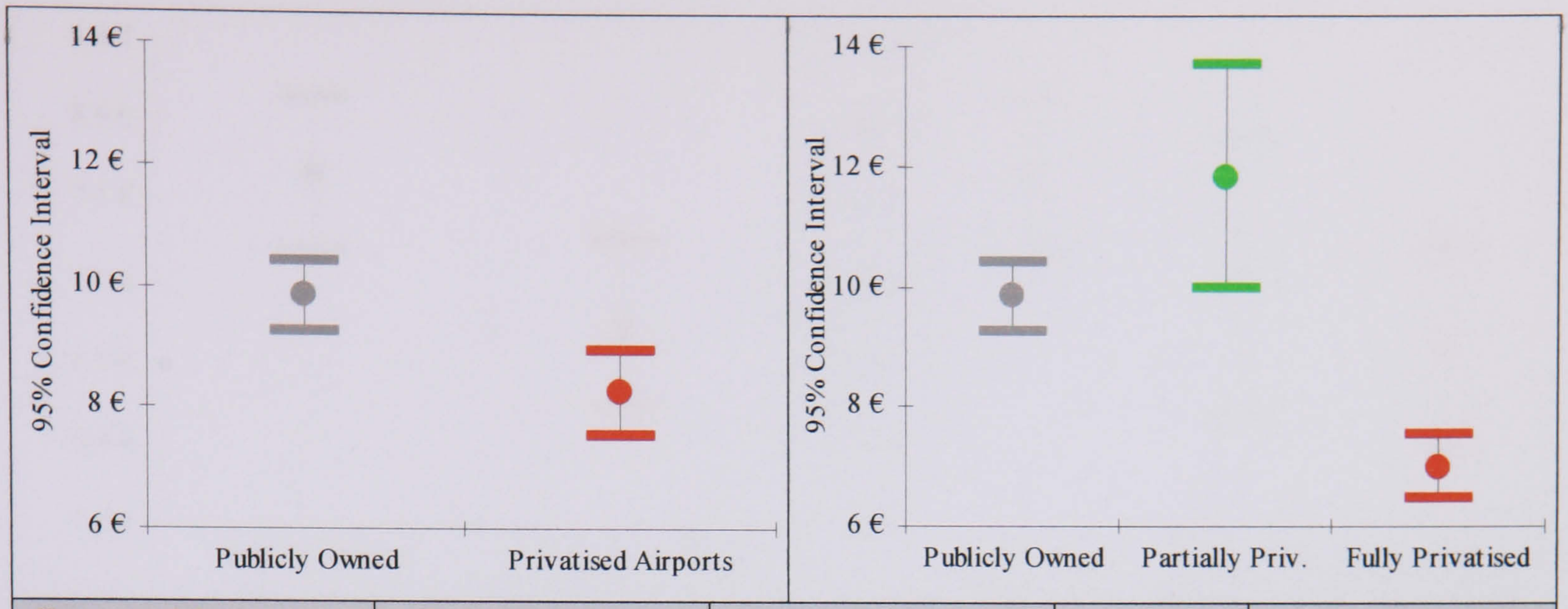
Figure 6.35: Error Bar Graphs of Inflation-Adjusted Total Revenue per WLU 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 5.2777 € | 2.88 € | 4.851 | .000 |
| Privatised Airports | 5.2135 € | | | |

The difference in inflation-adjusted total unit revenues (Figure 6.35) is highly significant between publicly owned and privatised airports. Partially and fully privatised sample airports are rather heterogeneous also on this criterion.

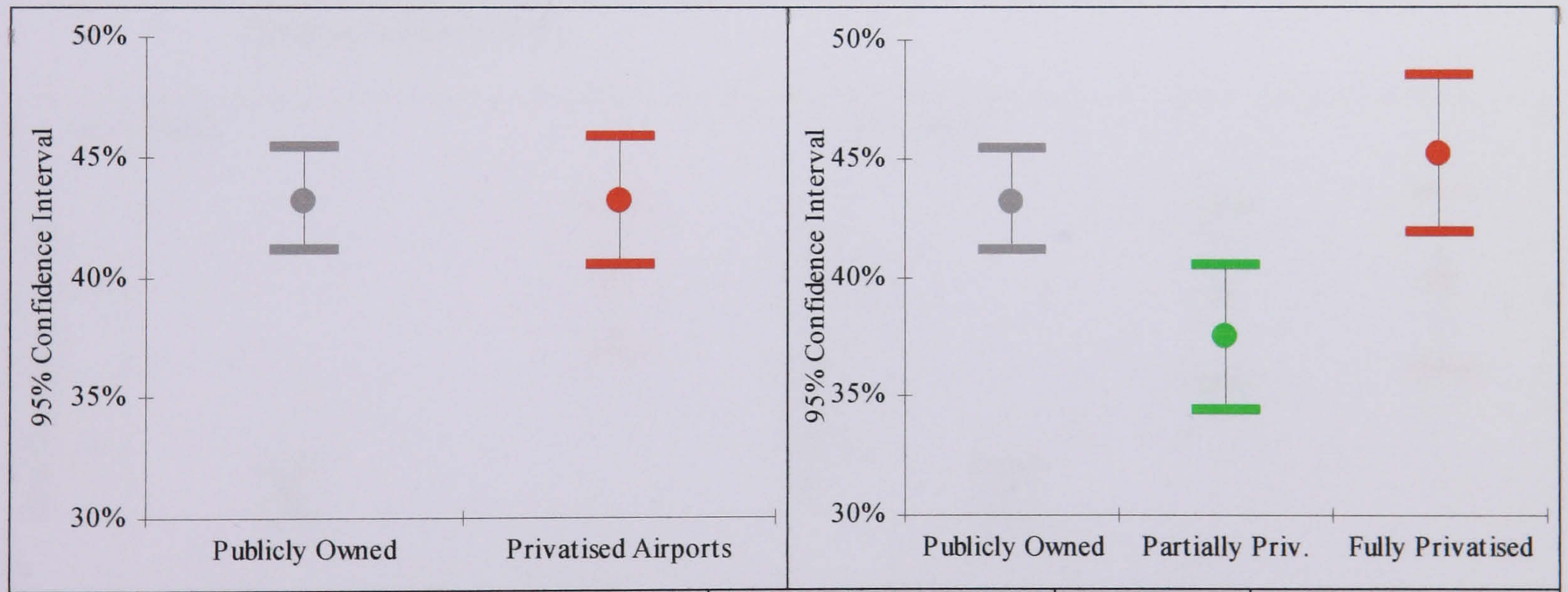
Figure 6.36: Error Bar Graphs of Inflation-Adjusted Aeronautical Revenue per WLU 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 4.0860 € | 1.57 € | 3.394 | .001 |
| Privatised Airports | 4.1283 € | | | |

There is also a significant difference in inflation-adjusted aeronautical revenue per work load unit (Figure 6.36) between publicly owned and privatised airports.

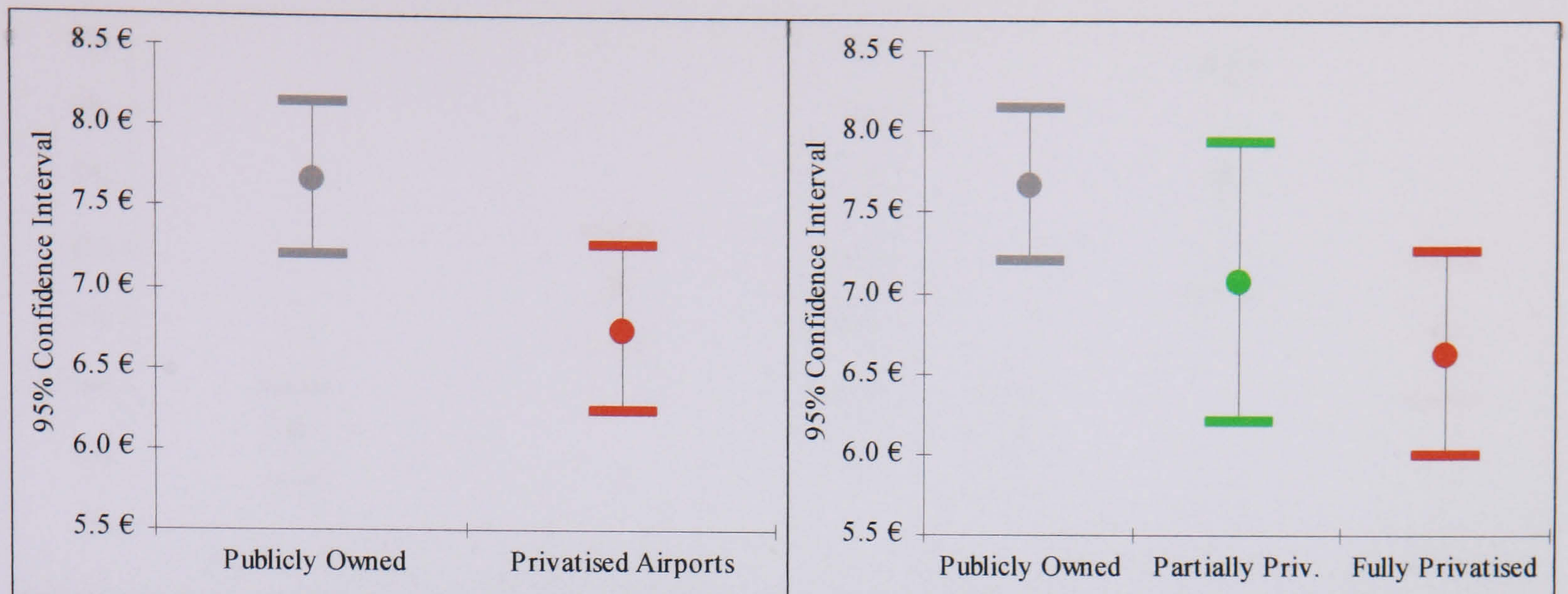
Figure 6.37: Error Bar Graphs of Non-Aeronautical Share of Total Revenue 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 15.5195% | .09% | .051 | .960 |
| Privatised Airports | 15.0390% | | | |

The non-aeronautical share of total revenue (Figure 6.37) does not differ significantly between publicly owned and privatised airports, while fully privatised ones reveal a markedly higher mean than partially privatised sample airports.

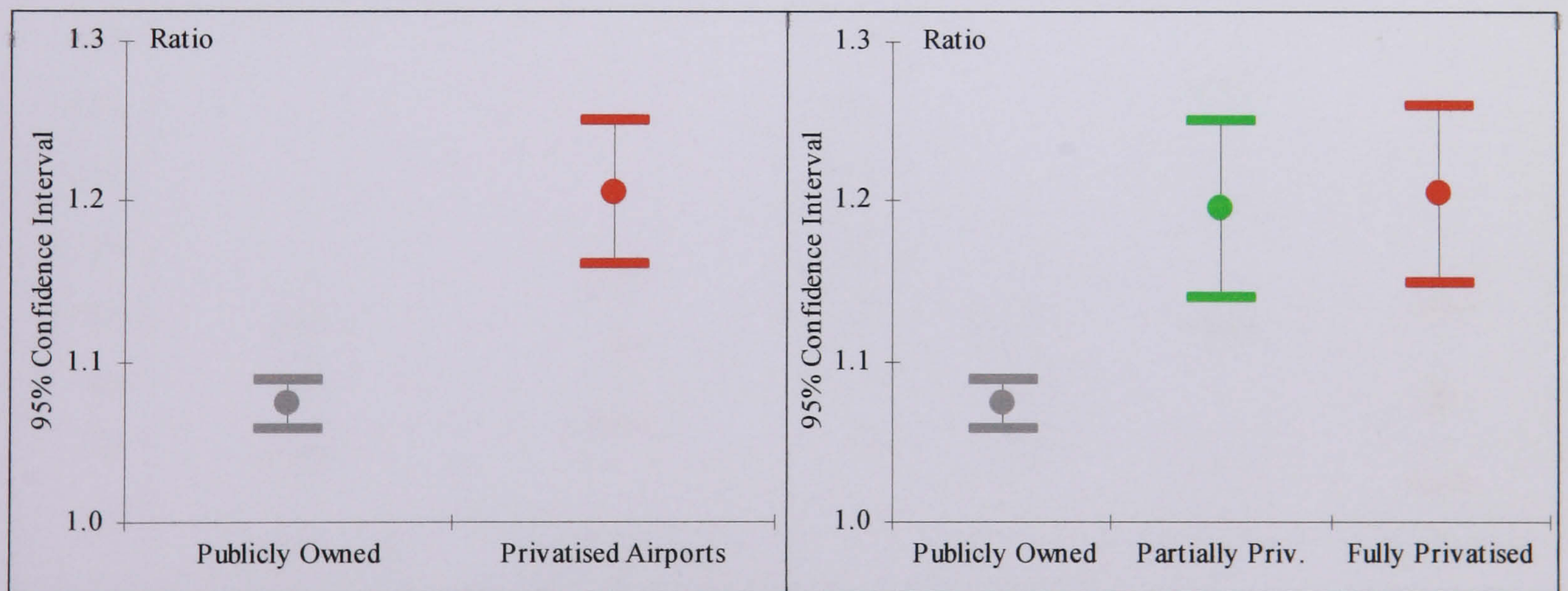
Figure 6.38: Error Bar Graphs of Inflation-Adjusted Commercial Revenue per Terminal Passenger 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 3.3612 € | .92€ | 2.552 | .011 |
| Privatised Airports | 2.9550 € | | | |

There is, however, a significant difference in inflation-adjusted commercial revenue per PAX (Figure 6.38). As opposed to the non-aeronautical share of total revenue (Figure 6.37), partially privatised airports reveal a higher value than fully privatised ones.

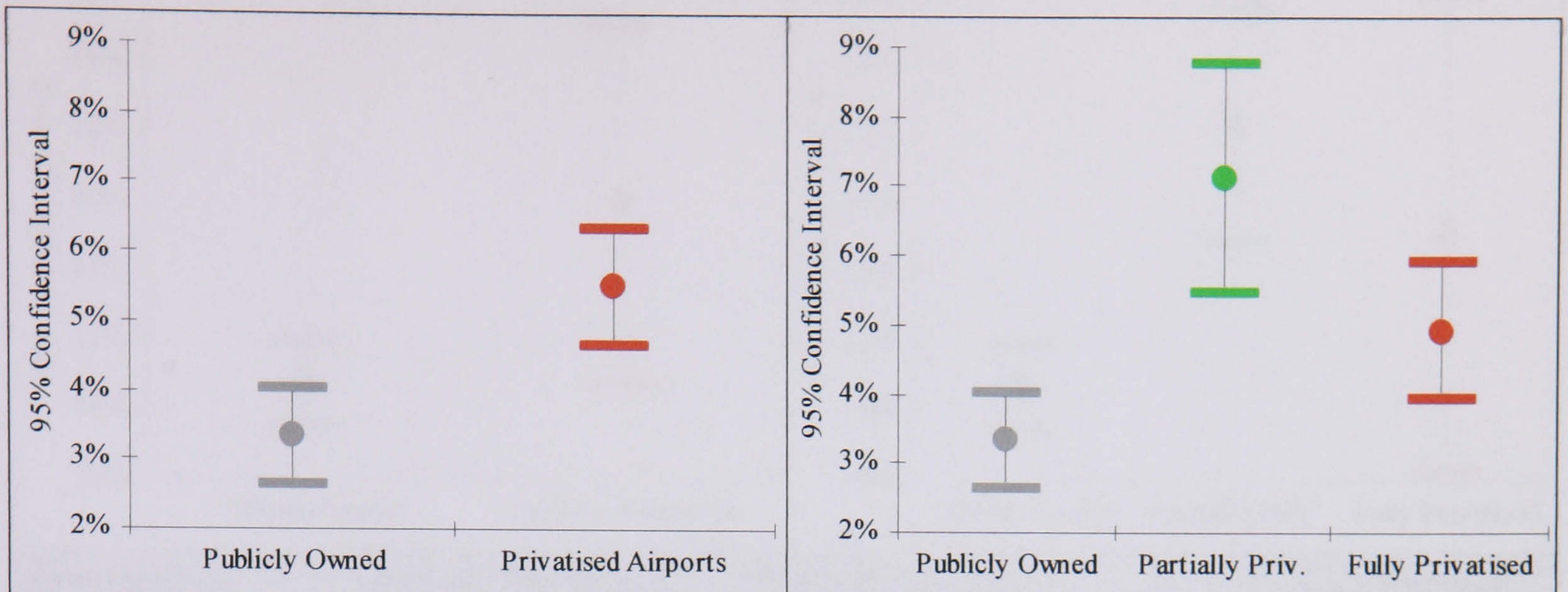
Figure 6.39: Error Bar Graphs of the Revenue / Expenditure Ratio 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | .1036 | -.130 | -6.698 | .000 |
| Privatised Airports | .2426 | | | |

The difference between the revenue/expenditure ratio (Figure 6.39) of publicly owned and privatised airports is highly significant. Privatised airports are very similar.

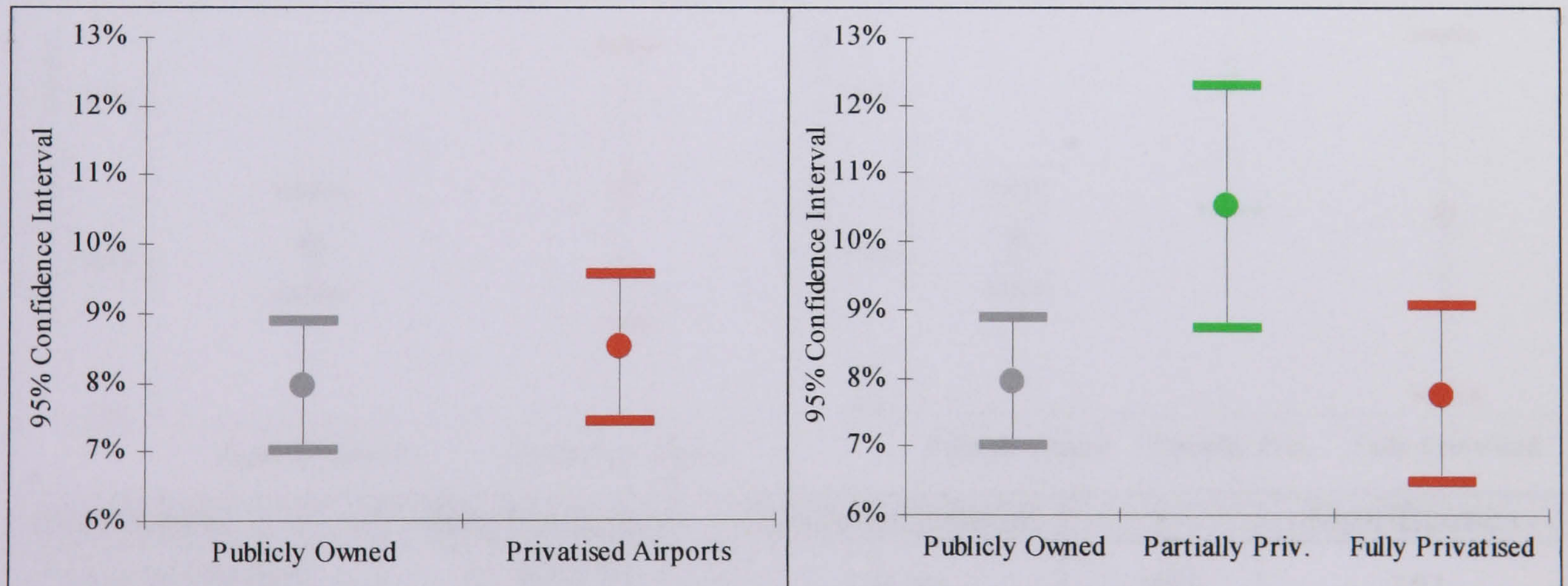
Figure 6.40: Error Bar Graphs of Return on Total Assets (ROA) 1990-1999
(Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 4.9593%<br>4.9143% | -2.17% | -3.874 | .000 |

In accordance with the results of financial ratio analysis, the return rates on assets (Figure 6.40) are also highly significantly different. In respect thereof, partially privatised sample airports are again clearly distinct from fully privatised ones.

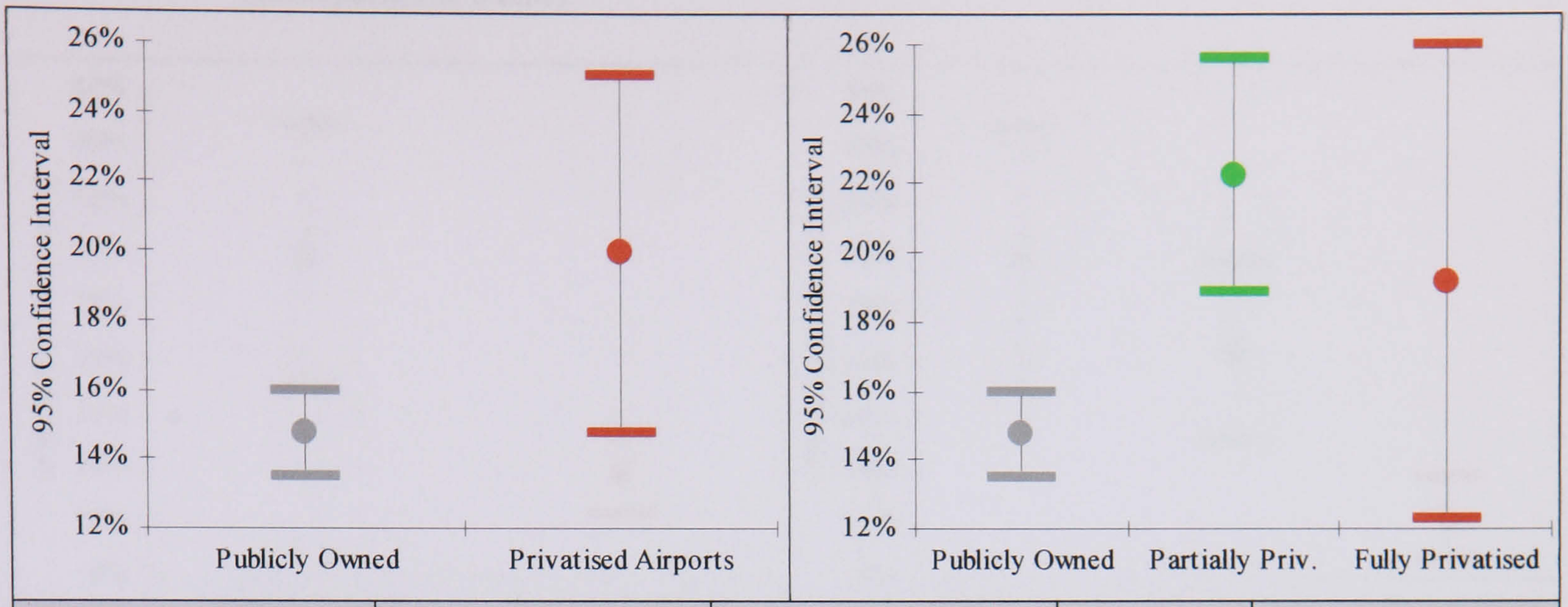
Figure 6.41: Error Bar Graphs of Return on Capital Employed (ROCE) 1990-1999
(Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 6.6167%<br>6.1451% | -.55% | -.757 | .450 |

No significant difference appears to exist with regard to return on capital employed (Figure 6.41). Partially privatised sample airports reveal the highest mean value.

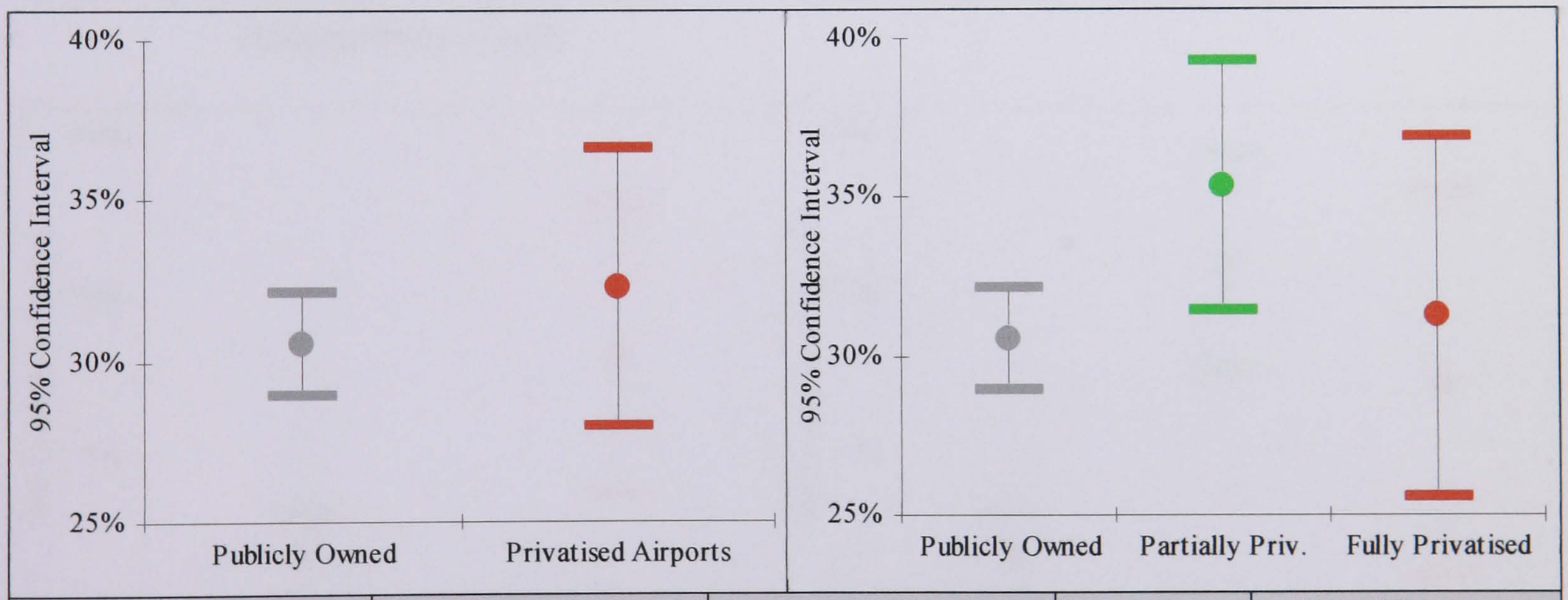
Figure 6.42: Error Bar Graphs of Operating Margin 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 8.9527% | -5.19% | -2.313 | .021 |
| Privatised Airports | 29.5781% | | | |

Operating or EBIT margins (Figure 6.42) of publicly owned and privatised airports are significantly different. As opposed to publicly owned sample airports, the standard deviation of all three sub groupings of privatised ones is considerably higher.

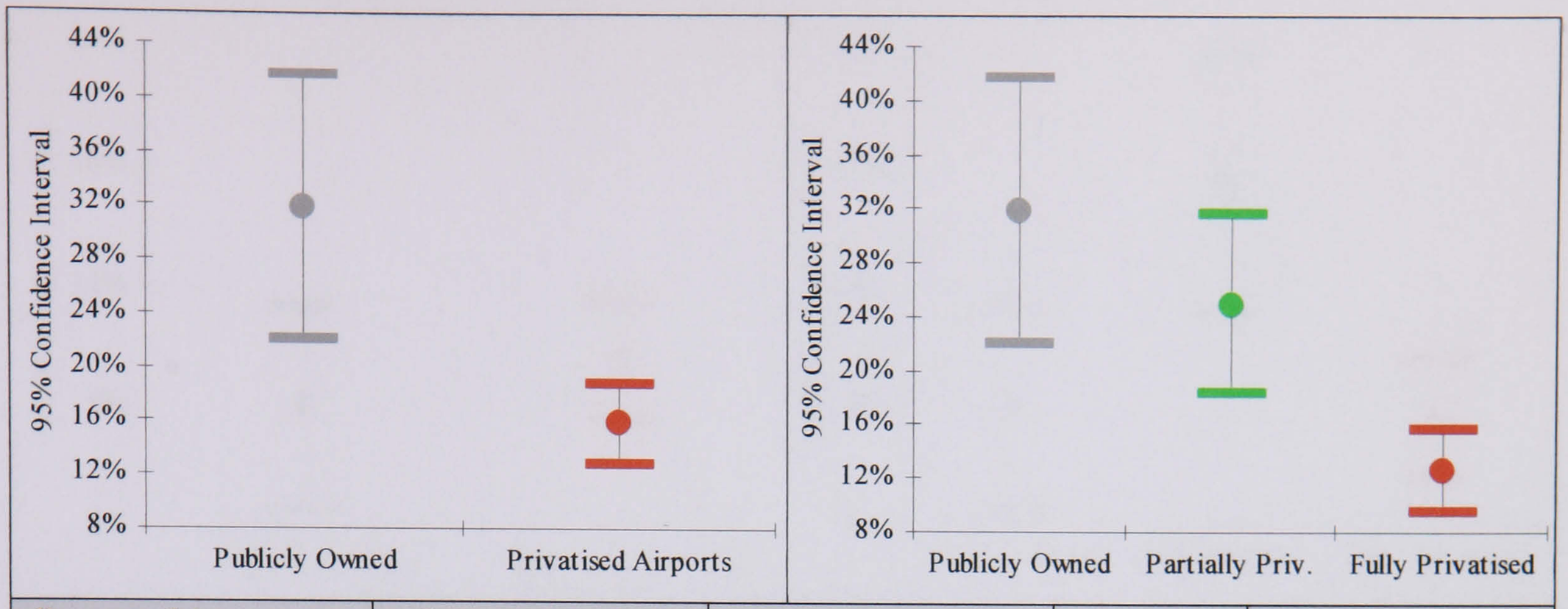
Figure 6.43: Error Bar Graphs of EBITDA Margin 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 11.4559% | -1.81% | -.895 | .371 |
| Privatised Airports | 24.6304% | | | |

EBITDA margins (Figure 6.43), however, are not significantly different. This is consistent with the different investment activities and different unit depreciation (Fig. 6.31) of publicly owned and privatised sample airports, which are neutralized at EBITDA level.

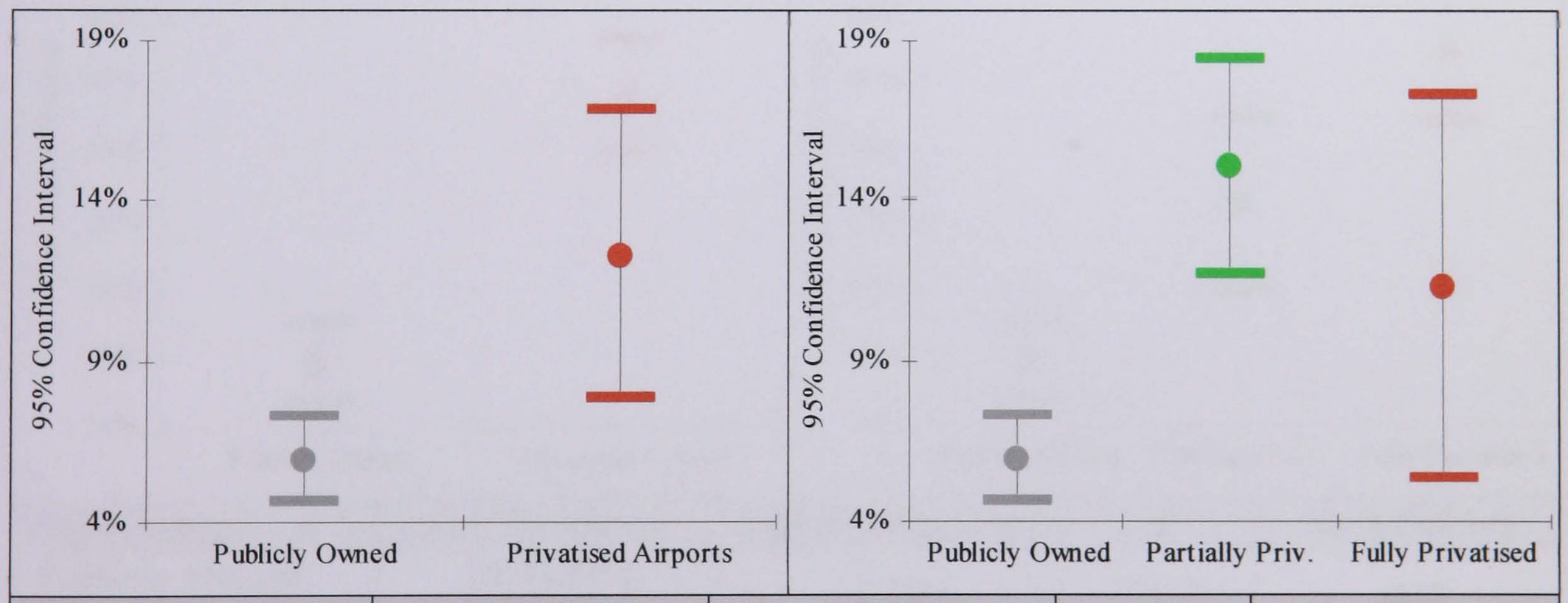
Figure 6.44: Error Bar Graphs of Return on Net Assets (RONA b.I.a.T) 1990-1999
(Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 67.5852% | 16.00% | 2.638 | .009 |
| Privatised Airports | 17.3343% | | | |

There is a significant difference between publicly owned and privatised airports regarding the return rate on net assets before interest and taxes (Figure 6.44). Partially privatised sample airports are again distinct from fully privatised ones.

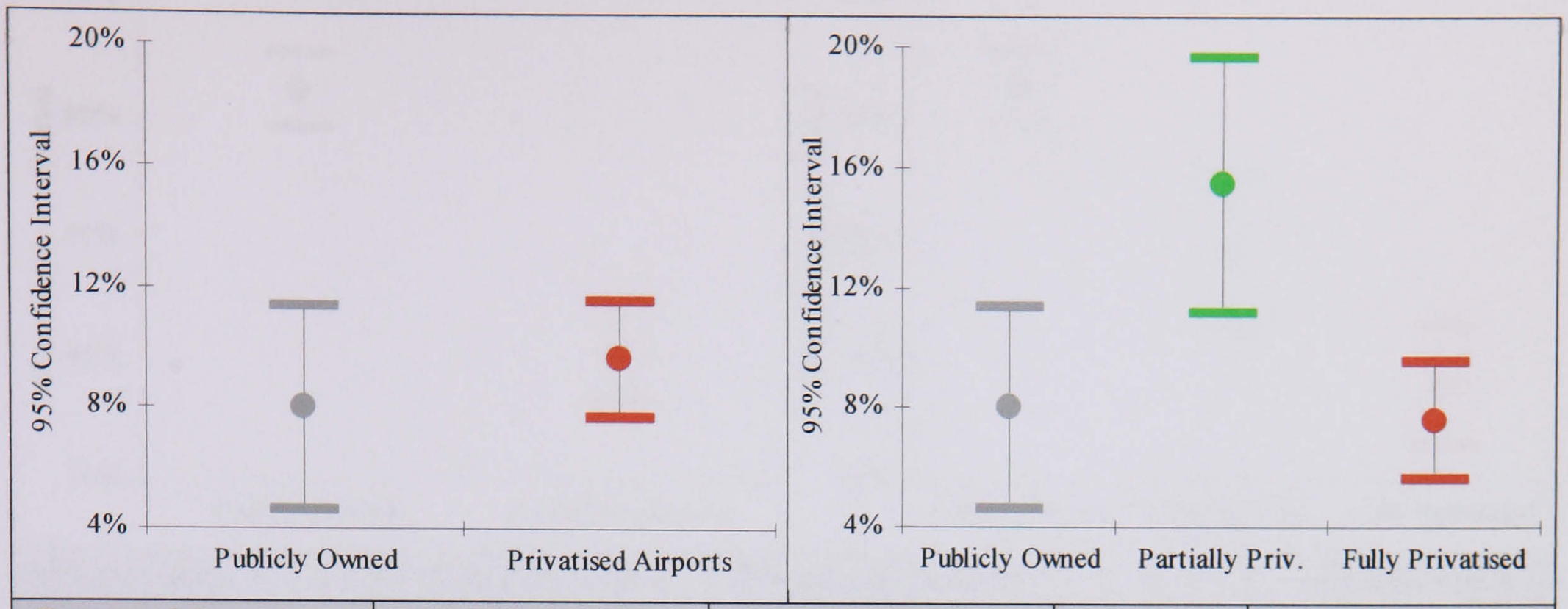
Figure 6.45: Error Bar Graphs of Return on Total Revenue (ROS) 1990-1999
(Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 9.2078% | -6.33% | -3.172 | .002 |
| Privatised Airports | 25.6980% | | | |

The return rates on total revenue (Figure 6.45) also differ significantly between publicly owned and privatised airports. Partially privatised ones reveal the highest value.

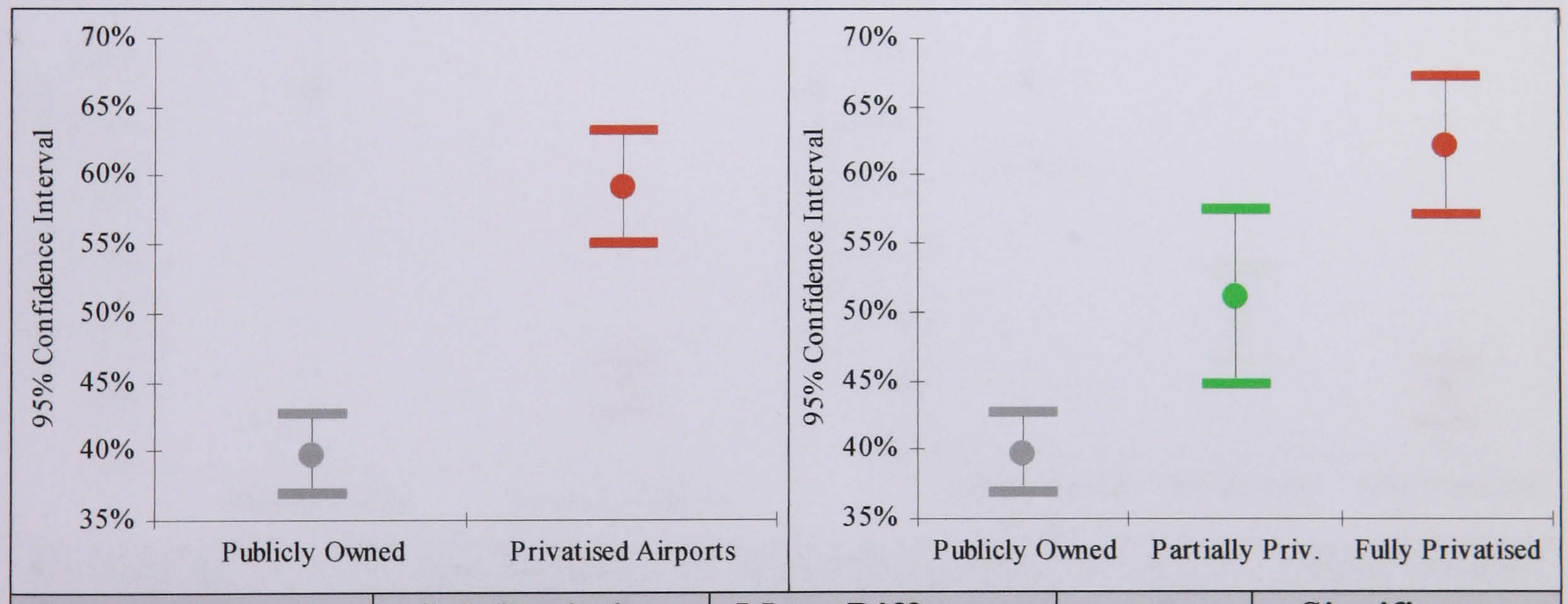
Figure 6.46: Error Bar Graphs of Return on Shareholders' Funds (ROE) 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 23.6057% | -1.63% | -.732 | .465 |
| Privatised Airports | 10.9790% | | | |

No significant difference was tested for the rate of return on equity (Figure 6.46) of publicly owned versus privatised airports.

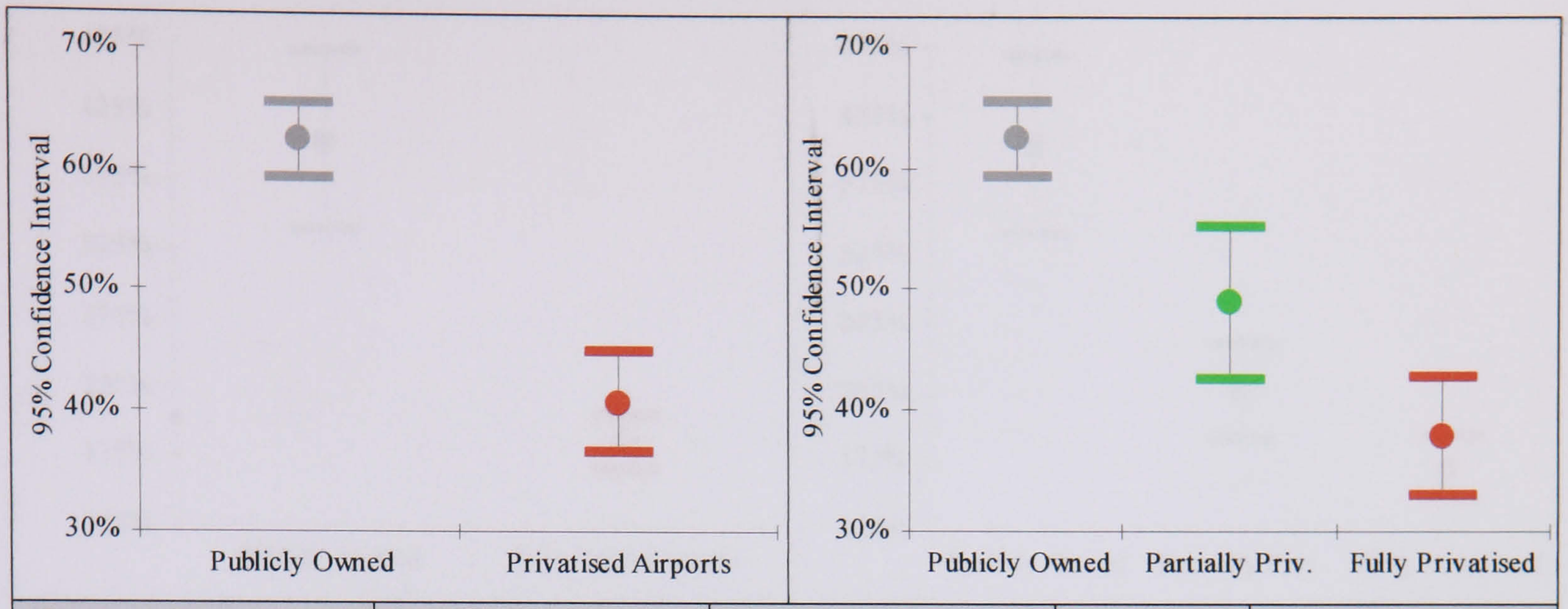
Figure 6.47: Error Bar Graphs of Net Assets in Percent of Total Assets 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 20.4389% | -19.48% | -7.775 | .000 |
| Privatised Airports | 23.7410% | | | |

The difference in the percentage of net assets to total assets (Figure 6.47) between publicly owned and privatised airports is highly significant. Fully privatised airports reveal the highest equity share, followed by partially privatised and those in public ownership.

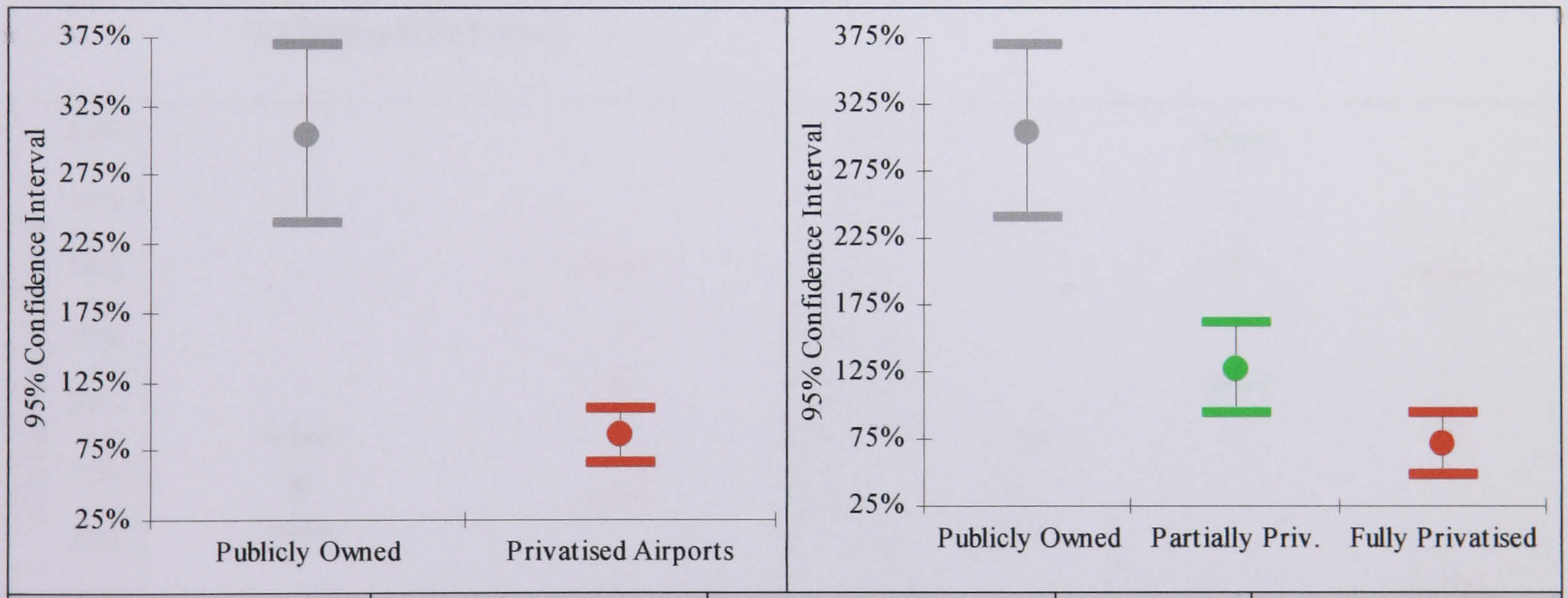
Figure 6.48: Error Bar Graphs of Debt Ratio 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 21.8745%<br>23.7410% | 21.72% | 8.472 | .000 |

The difference in debt ratio (Fig. 6.48) is highly significant, complementing net assets (Figure 6.47). Partially privatised airports again assume an intermediate position.

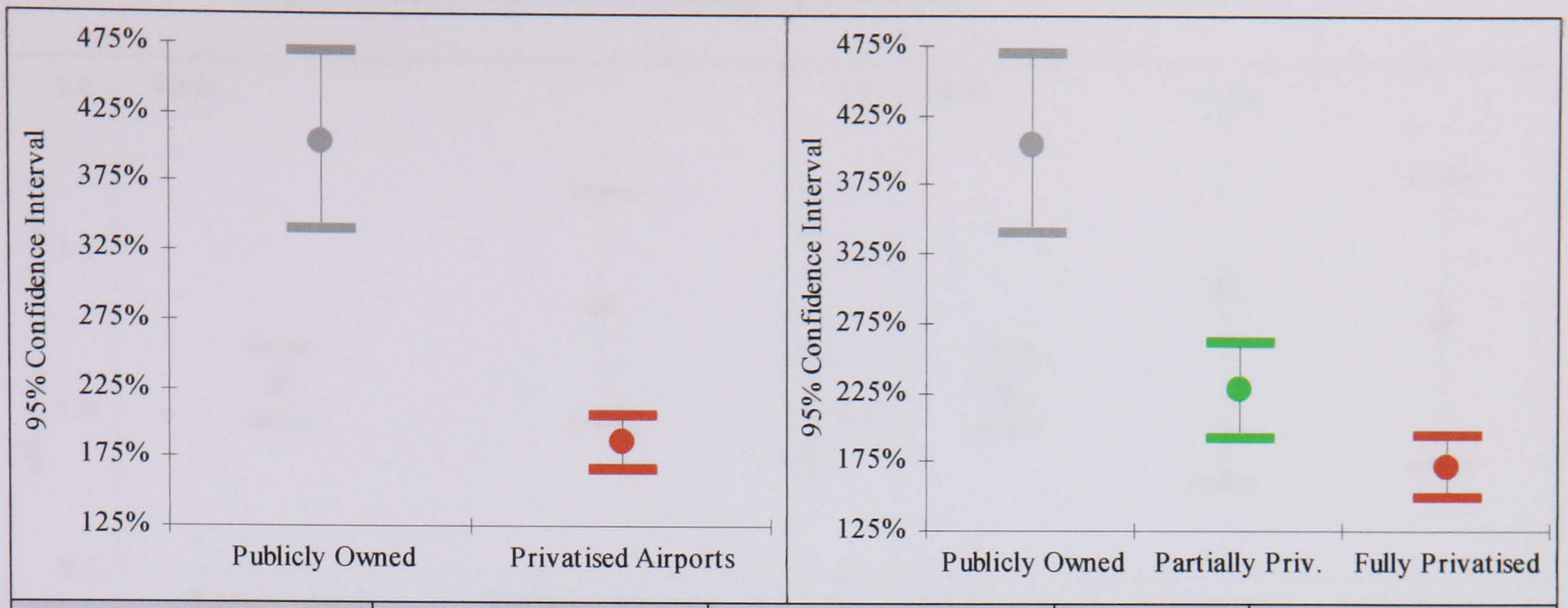
Figure 6.49: Error Bar Graphs of Gearing (Debt / Equity Ratio) 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 440.4789%<br>111.4425% | 218% | 5.520 | .000 |

Consistently with the results regarding the debt ratio, the difference in gearing (Figure 6.49) between publicly owned and privatised airports tested highly significant. Although the standard deviation of publicly owned airports is four times higher, even the lowest values are approximately twice as high as the gearing of privatised airports.

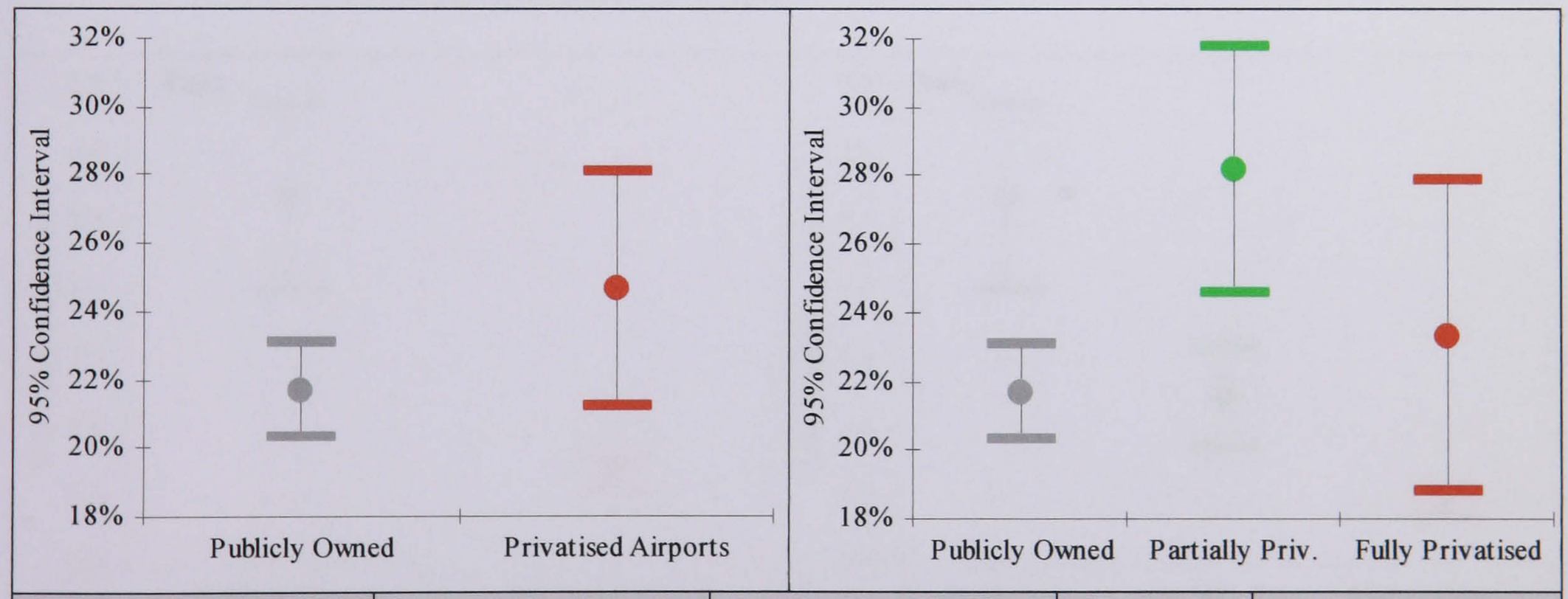
Figure 6.50: Error Bar Graphs of Financial Leverage 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 440.4790%<br>111.4425% | 218f | 5.520 | .000 |

The findings concerning gearing (Figure 6.49) are in turn reflected in the difference of financial leverage (Figure 6.50), which is also highly significant. By definition, financial leverage is exactly one hundred percentage points higher than gearing.

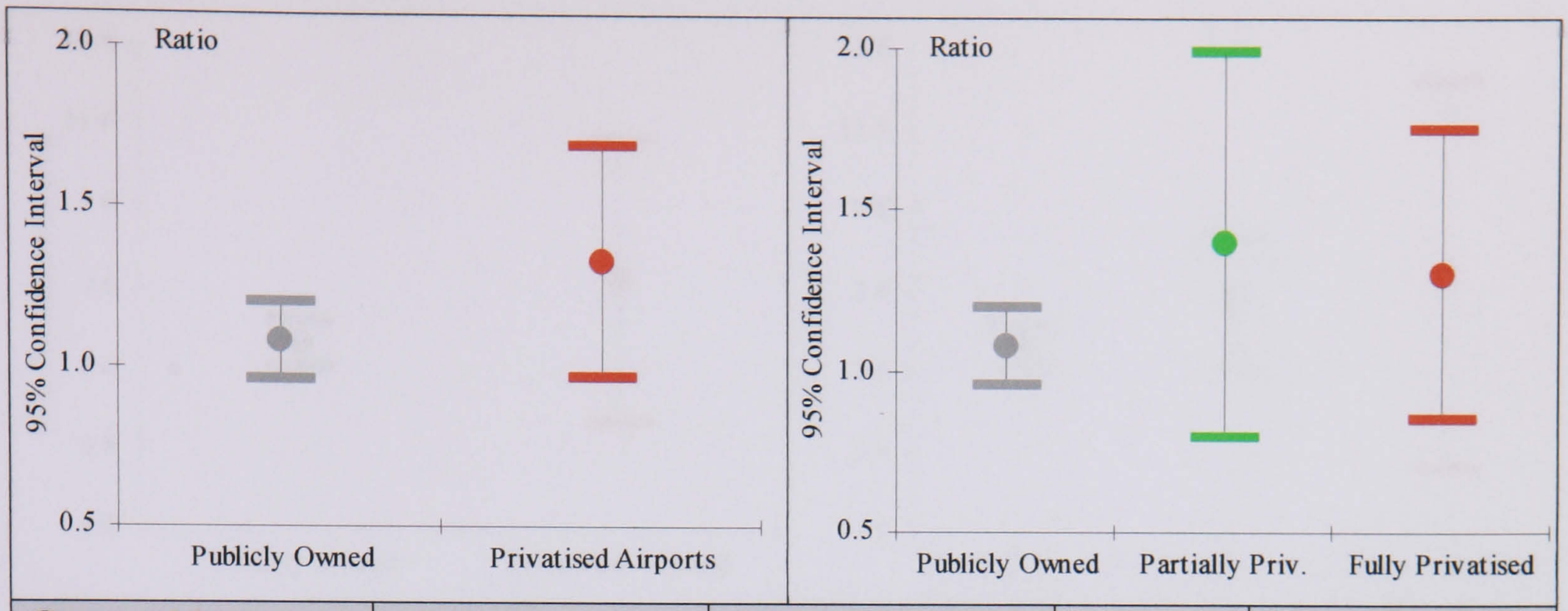
Figure 6.51: Error Bar Graphs of Cash Flow in Percent of Total Revenue 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned<br>Privatised Airports | 9.9874%<br>20.0897% | -2.95% | -1.762 | .079 |

In statistical terms, there is no significant difference between publicly owned and privatised airports regarding cash flow in percent of total revenue (Figure 6.51). Nevertheless, privatised airports reveal higher values on average than publicly owned ones.

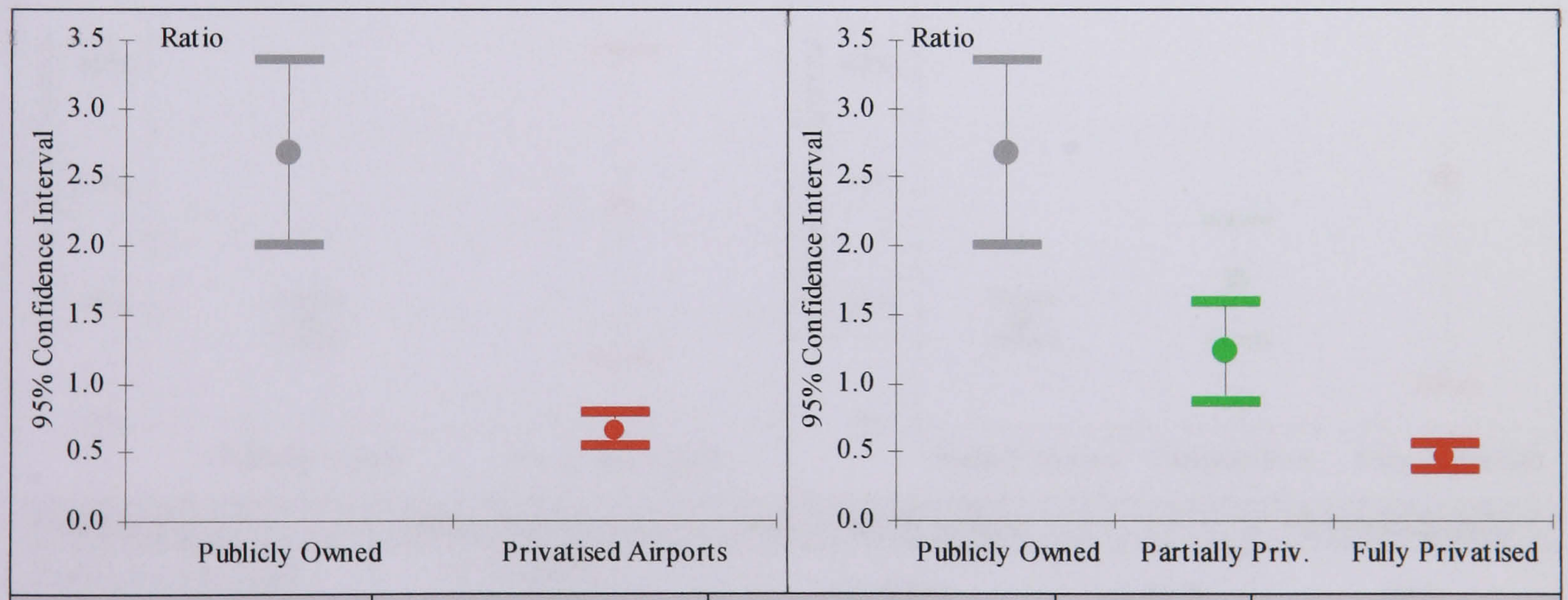
Figure 6.52: Error Bar Graphs of Investment Coverage Ratio (Cash Flow / Capital Expenditure) 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | .8766 | -.246 | -1.474 | .141 |
| Privatised Airports | 2.0521 | | | |

Also the difference between the investment coverage ratio (Figure 6.52) of publicly owned versus privatised sample airports is not significant. The wide standard deviation of privatised – and especially partially privatised – airports is remarkable.

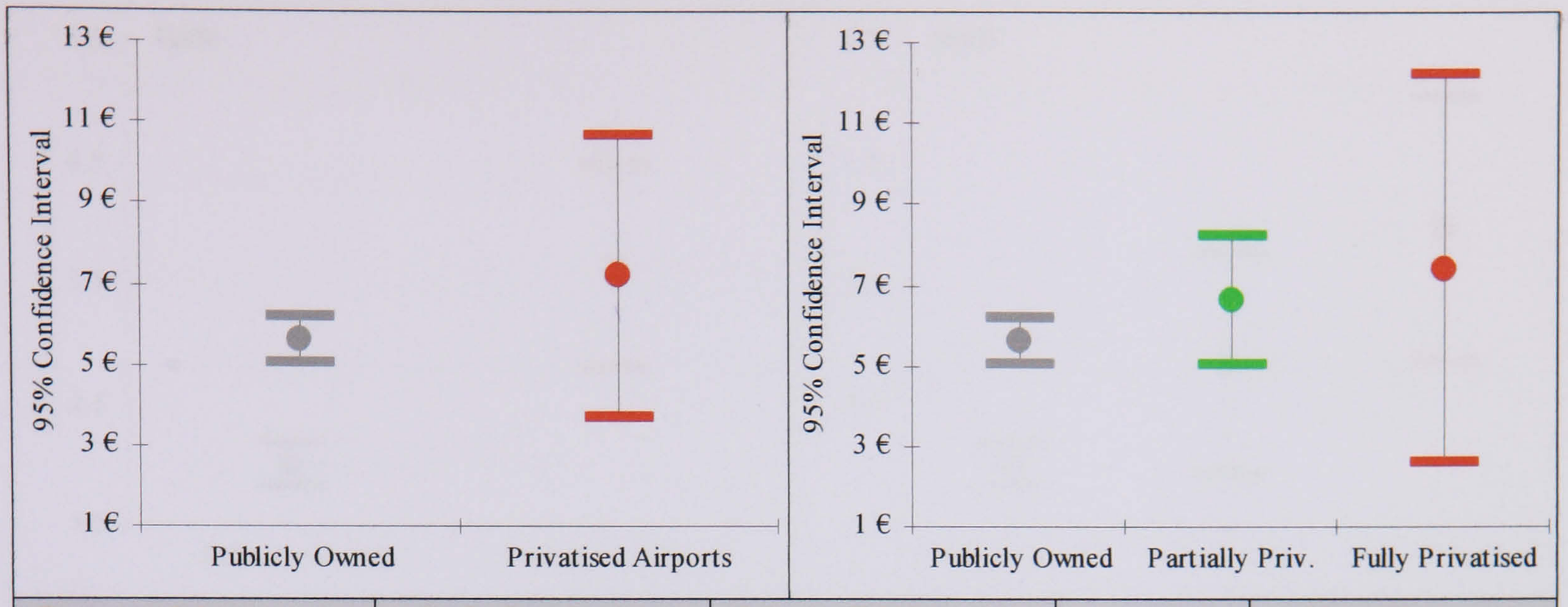
Figure 6.53: Error Bar Graphs of Total Revenue per Currency Unit of Shareholders' Funds 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 4.6386 | 2.008 | 4.889 | .000 |
| Privatised Airports | .7478 | | | |

The difference in total revenue per shareholders' funds (Figure 6.53) is highly significant. There is also a clear difference between partially and fully privatised airports.

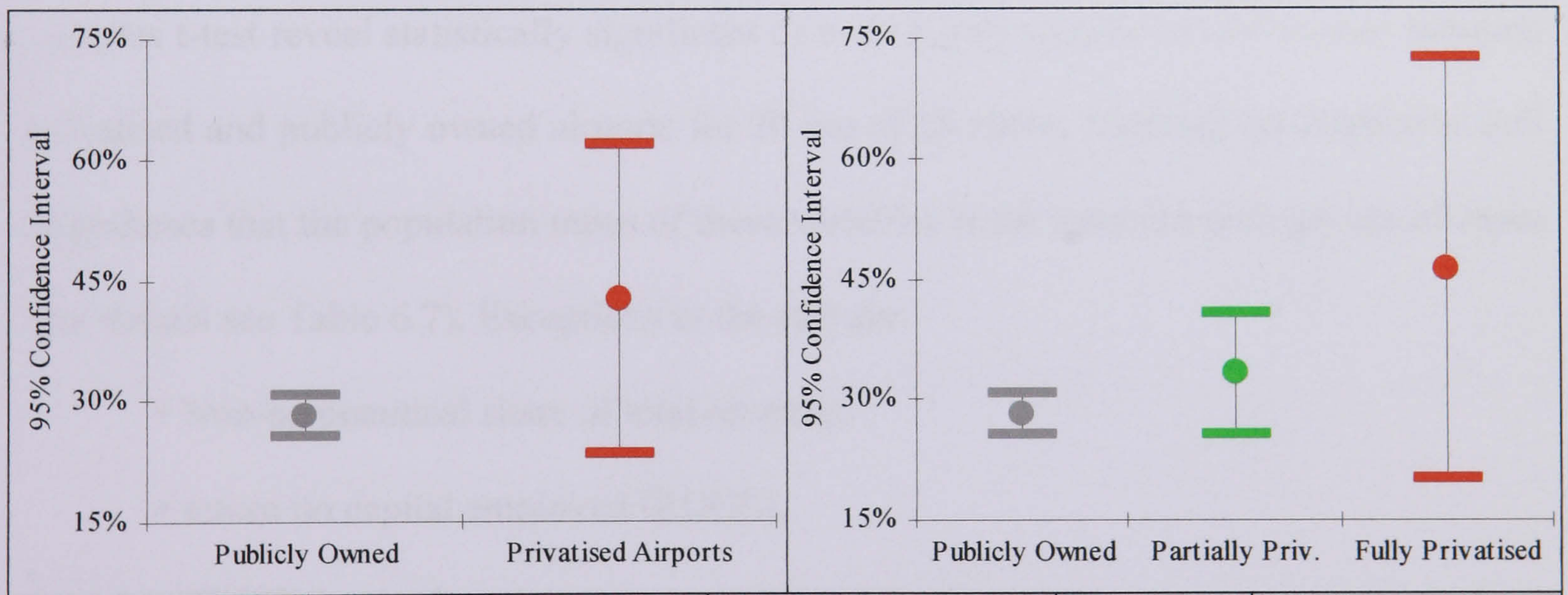
Figure 6.54: Error Bar Graphs of Inflation-Adjusted Capital Expenditure per Terminal Passenger 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 4.0519 € | -1.57 € | -1.067 | .287 |
| Privatised Airports | 19.8686 € | | | |

Capital expenditure per passenger (Figure 6.54) did not test significant. A huge standard deviation is recorded for privatised (and fully privatised) sample airports.

Figure 6.55: Error Bar Graphs of Capital Expenditure in Percent of Total Revenue 1990-1999 (Independent t-test)




| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 17.7904% | -14.57% | -1.826 | .069 |
| Privatised Airports | 108.7415% | | | |

Although privatised airports reveal a higher mean value in Figure 6.55, there is no significant difference. Despite the high variance, fully privatised sample airports invest a considerably higher share as opposed to partially privatised ones on average.

Figure 6.56: Error Bar Graphs of Capital Expenditure to Depreciation Ratio 1990-1999 (Independent t-test)


| Ownership | Std. Deviation | Mean Difference | t | Significance |
|---|---|---|---|---|
| Publicly Owned | 1.2929 | -1.655 | -4.607 | .000 |
| Privatised Airports | 4.7304 | | | |

The ratio of capital expenditure to depreciation (Figure 6.56), however, is highly significant between publicly owned and privatised airports. Partially privatised sample airports are again assuming an intermediate position in this respect as well.

As illustrated by the respective error bar graphs, the results of the independent samples t-test reveal statistically significant or even highly significant differences between privatised and publicly owned airports for 20 out of 28 ratios, rejecting the respective null hypotheses that the population mean of these variables is the same for both groups of cases (for details see Table 6.7). Exceptions to the rule are:

- Non-aeronautical share of total revenue,
- return on capital employed (ROCE),
- EBITDA margin,
- return on shareholders' funds (ROE),
- cash flow in percent of total revenue,
- investment coverage ratio (cash flow/capital expenditure),
- capital expenditure per terminal passenger and
- capital expenditure in percent of total revenue.

Whereas partially and fully privatised airports show improved ratios in the majority of cases, it is worthwhile noting that with regard to the following ratios publicly owned companies are significantly more economical or successful (for details see Table 6.7):

- Asset utilization (WLU/total assets in '000),
- total asset and fixed asset turnover,
- revenue generation in terms of total revenue per WLU (ind. to 1995), as well as
- real aeronautical revenue per WLU,
- real commercial revenue per terminal passenger,
- return on net assets (RONA before interest and taxes),
- total revenue per currency unit of shareholders' funds and the
- capital expenditure to depreciation ratio.

It needs to be pointed out that especially when ratios involving balance sheet elements are being considered, the test reveals distinct differences again confirming a different capital structure and capital productivity of sample airports and a different way of financing the productive assets. This fact had already been established in the course of financial ratio analysis, especially in terms of the respective debt ratios and gearing.

In this respect, the partially privatised airports assume an outstanding position within the group of privatised entities. Differentiating between partially and fully privatised businesses clearly shows that privatised airports do not constitute a homogeneous group, but reveals differences amongst them as illustrated by the error bar graphs in Figures 6.29 through 6.56. Several distinctions exist, most markedly regarding:

- Unit cost (total/operating/depreciation cost per WLU indexed to 1995),
- revenue generation (total revenue/aeronautical revenue per WLU indexed to 1995) and total revenue per currency unit of shareholders' funds,
- total asset and fixed asset turnover,
- capital structure (debt ratio, gearing and financial leverage),

- return on capital employed (ROCE),
- net assets in percent of total assets,
- return on net assets (RONA before interest and taxes),
- return on total assets (ROA),
- return on shareholders' funds (ROE) and
- capex in percent of total revenue as well as capex to depreciation ratio.

Partially privatised and publicly owned airports appear to generate comparatively higher unit revenues. This may be attributable to different regulatory regimes (quasi-monopolies) and possibly a different customer base (lower share of – at the time – upcoming no frills low-cost carriers). Publicly owned airports generate significantly higher total revenue per currency unit of shareholders' funds, owing to their relatively low equity share as compared to privatised airports. The comparatively high equity share of partially and fully privatised airports is causal for their lower debt ratio, gearing and financial leverage (for details see Table 6.7).

Detailing further for regional differences between airports located in Mainland Europe vs. the British Isles (as well as German vs. other European vs. UK/Irish vs. BAA owned airports) as indicated in the 'Best in Class' column of Table 6.7 below, does not reveal as pronounced differences as those found regarding ownership structure. Differences definitely do exist – primarily between airports operating in Mainland Europe as opposed to those in the British Isles, reflecting the high proportion of partially and fully privatised airports and the comparatively long duration since privatisation – although not as often measured as statistically significant on 95% confidence intervals.

Table 6.7 summarizes the main findings of the independent samples t-test. It reads that average total cost per WLU of publicly owned airports, for example, is 3.66 € higher than the 12.41 € average of partially and fully privatised airports. Average operating cost per WLU is 3.33 € higher than with privatised airports (11.36 €), and so on.

Table 6.7: Results of Independent Samples t-Test based on 35 Airports

| Dependent Variables / Ratios | Ownership Significic. | | | Mean Value of | | Mean | Best in Class | |
|---|---|---|---|---|---|---|---|---|
| | highly sig. | sig. | not sig. | Publicly Owned | vs. Privatised | = Difference | Public/ Private | British Isles/ Mainland EU |
| Total cost per WLU (indexed to 1995) | ◆ | | | 16.07 € | 12.41 € | 3.66 € | Private | British Isles |
| Operating cost per WLU (indexed to '95) | ◆ | | | 14.69 € | 11.36 € | 3.33 € | Private | British Isles |
| Depreciation cost per WLU (indexed to '95) | ◆ | | | 2.56 € | 1.71 € | .85 € | Private | British Isles |
| Asset utilization (WLU/total assets '000) | ◆ | | | 36 | 26 | 10 | Public | Mainland EU |
| Total asset turnover | ◆ | | | .550 | .344 | .206 | Public | Mainland EU |
| Fixed asset turnover | | ◈ | | 1.269 | .440 | .829 | Public | Mainland EU |
| Total revenue per WLU (indexed to '95) | ◆ | | | 17.24 € | 14.36 € | 2.88 € | Public | Mainland EU |
| Aeron. revenue per WLU (indexed to '95) | | ◈ | | 9.83 € | 8.26 € | 1.57 € | Public | Mainland EU |
| Non-aeronautical share of total revenue | | | ◇ | 43.24% | 43.15% | .09% | n/a | |
| Comm. revenue per PAX (indexed to '95) | | ◈ | | 7.66 € | 6.74 € | .92 € | Public | British Isles |
| RevEx ratio | ◆ | | | 1.073 | 1.203 | -.130 | Private | British Isles |
| Return on total assets (ROA) | ◆ | | | 3.33% | 5.50% | -2.17% | Private | British Isles |
| Return on capital employed (ROCE) | | | ◇ | 7.94% | 8.49% | -.55% | n/a | |
| Operating margin | | ◈ | | 14.77% | 19.96% | -5.19% | Private | British Isles |
| EBITDA margin | | | ◇ | 30.50% | 32.31% | -1.81% | n/a | |
| Return on net assets (RONA b.I.a.T.) | | ◈ | | 31.83% | 15.83% | 16.00% | Public | Mainland EU |
| Return on total revenue (ROS) | | ◈ | | 5.96% | 12.29% | -6.33% | Private | British Isles |
| Return on share-holders' funds (ROE) | | | ◇ | 8.00% | 9.63% | -1.63% | n/a | |
| Net assets in percent of total assets | ◆ | | | 39.72% | 59.20% | -19.48% | Private | British Isles |
| Debt ratio | ◆ | | | 62.52% | 40.80% | 21.72% | Private | British Isles |
| Gearing | ◆ | | | 304% | 86% | 218% | Private | British Isles |
| Financial leverage | ◆ | | | 404% | 186% | 218% | Private | British Isles |
| Cash flow in percent of total revenue | | | ◇ | 21.69% | 24.64% | -2.95% | n/a | |
| Investment coverage ratio (CF/capex) | | | ◇ | 1.080 | 1.326 | -.246 | n/a | |
| Total revenue/ shareholders' funds | ◆ | | | 2.672 | .664 | 2.008 | Public | Mainland EU |
| Capital expendit. per PAX (indexed to '95) | | | ◇ | 5.63 € | 7.20 € | -1.57 € | n/a | |
| Capital expenditure in % of total revenue | | | ◇ | 28.12% | 42.69% | -14.57% | n/a | |
| Capital expenditure to depreciation ratio | ◆ | | | 2.003 | 3.658 | -1.655 | Public | Mainland EU |

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
The BAA Group is excluded from calculation to avoid double counting.

As far as the reinvestment of funds into the business is concerned, it is worthwhile noting that capital expenditure in percent of total revenue (Figure 6.55) appears to be highest for fully privatised airports and airports situated in the British Isles. But this is probably closely related to overall investment programmes alongside traffic growth, as for example terminal expansions in STN and FRA. Also the capital expenditure to depreciation ratio (Figure 6.56) and capex per passenger (Figure 6.54) are highest for fully privatised airports.

The investment coverage ratio (cash flow/capital expenditure) and cash flow as percentage of total revenue appear to be highest for partially privatised airports and airports located in the British Isles. All cash flow related ratios are driven by capital expenditure which is growing the asset base with an immediate impact on ratios involving assets and depreciation. Asset utilization in terms of WLUs to total assets as well as total asset and fixed asset turnover are significantly higher with publicly owned airports.

As stated at the outset, another aspect of this study is to investigate changes in the financial performance of sample airports over time, following a longitudinal approach. Therefore, a sub set of the total sample is being subjected to a paired- or matched-samples t-test.

### 6.4.2 Repeated Measures Design: Paired-Samples t-Test

Subjects of the matched-samples t-test are the nine sample airports which experienced a change in ownership structure during the period under consideration. These are ADR, BRS, CPH, HAJ, NAP and VIE, which were partially privatised and the fully privatised BFS, CWL and EMA, as per Table 6.8 below. Due to its pseudo-partial privatisation under the Eurohub Ltd. BOT-scheme, BHX is considered partially privatised for the full period. Likewise, LPL is accounted for as fully privatised for the full period in accordance with the definitions in Chapter 3 (Table 3.1), although the private sector share

was only increased to 100% in 2001 from previously 76%. Because of data incomparability, DUS and LTN are not included for the full period under scrutiny.

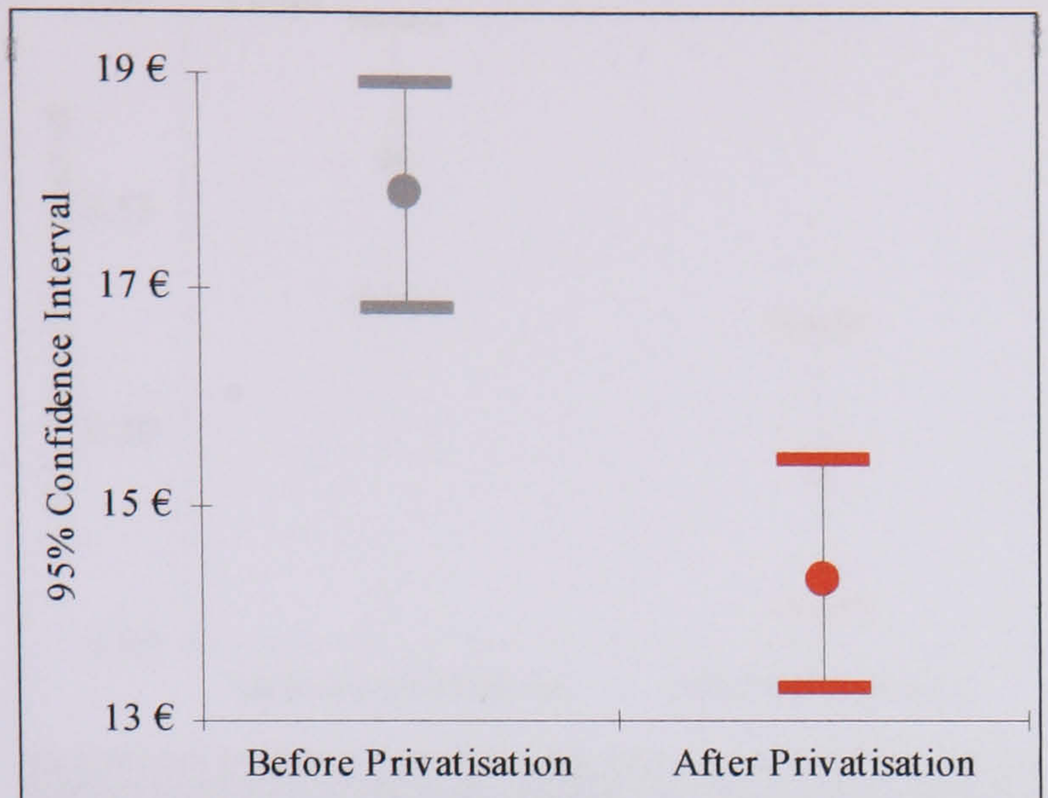
Table 6.8: Airports transferred from Public to Private Ownership in the Period 1990-1999

| **British Isles** | | **Mainland Europe** | |
|---|---|---|---|
| **UK/Irish** | **BAA** | **German** | **European** |
| BFS<br>BRS<br>CWL<br>EMA | already privatised since 1987 | HAJ | ADR<br>CPH<br>NAP<br>VIE |

The test includes the 28 indices and ratios as used in the independent samples t-test and compares the respective means prior to and after partial or full privatisation. Regardless of the duration of the respective time periods, the averages in this before/after-design are weighted equally. While the within-group design generally reduces the error variance making it easier to detect any systematic variance, it is a fact that despite the relative power of repeated measures designs the degrees of freedom are reduced likewise, since only nine sample airports lend themselves to this before/after approach. The paired-samples are only a subset of the total sample of 35 airports, and although fully consistent in itself, a one-to-one comparison to the findings of the independent samples t-test is limited.

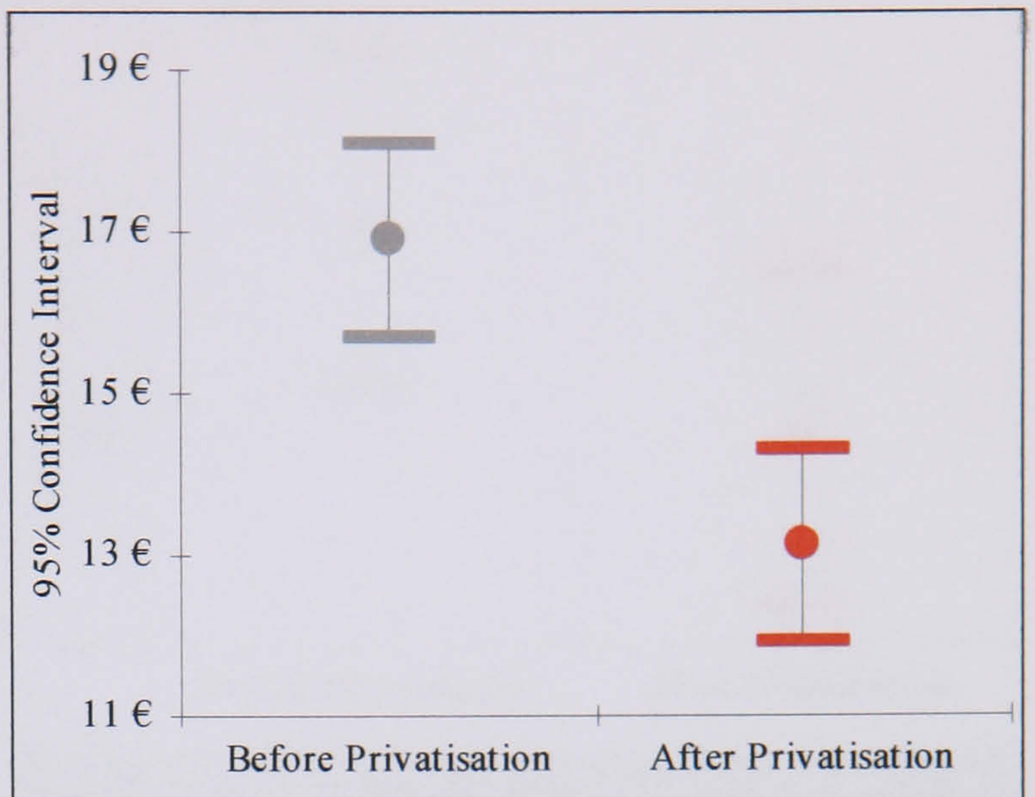
Nevertheless, the results of the dependent-samples t-test reveal statistically significant differences between sample airports prior to and after partial or full privatisation for twelve ratios. The respective null hypotheses that a change in ownership structure has no statistically significant effect on the financial performance of commercial airports are rejected for these cases by relatively strong t-values on a 95% confidence level. This is illustrated by the corresponding error bar graphs (Figures 6.57-6.84), displaying the differences for 95% confidence intervals. The footers below the graphs also render the mean difference between the respective averages of once publicly owned airports versus those after their partial or full privatisation. A significance below 0.0500 indicates a significant difference between the two variables prior to and after the change in ownership.

Figure 6.57: Error Bar Graph of Inflation-Adjusted Total Cost per WLU 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 3.51 € | 3.881 | .005 |

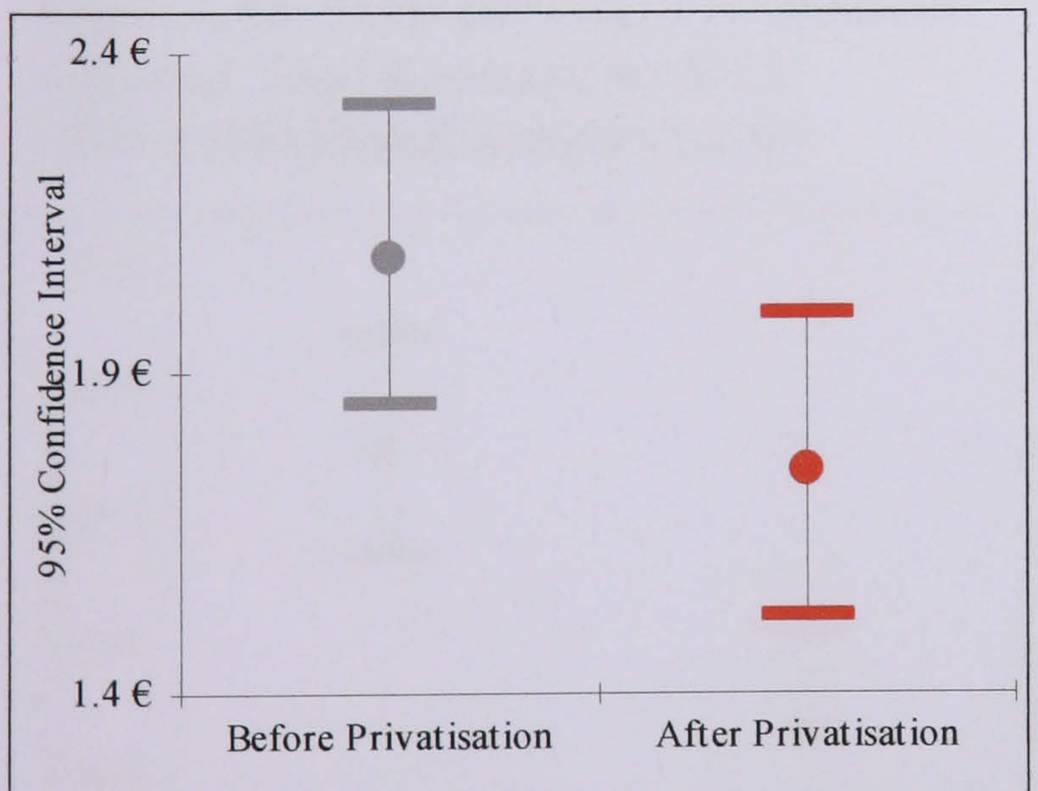
Figure 6.58: Error Bar Graph of Inflation-Adjusted Operating Cost per WLU 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 3.78 € | 3.608 | .007 |

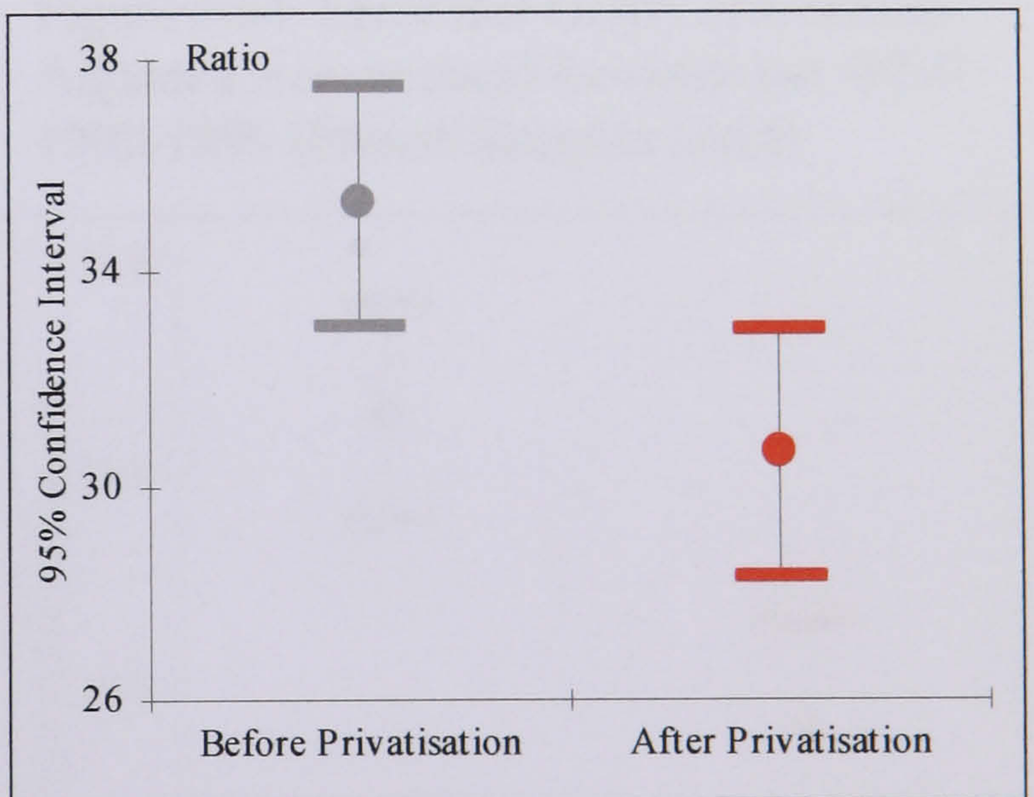
Inflation-adjusted total unit cost (Figure 6.57) and operating unit cost (Figure 6.58) are significantly different before and after partial or full privatisation.

Figure 6.59: Error Bar Graph of Inflation-Adjusted Depreciation Cost per WLU 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | .33 € | 1.605 | .147 |

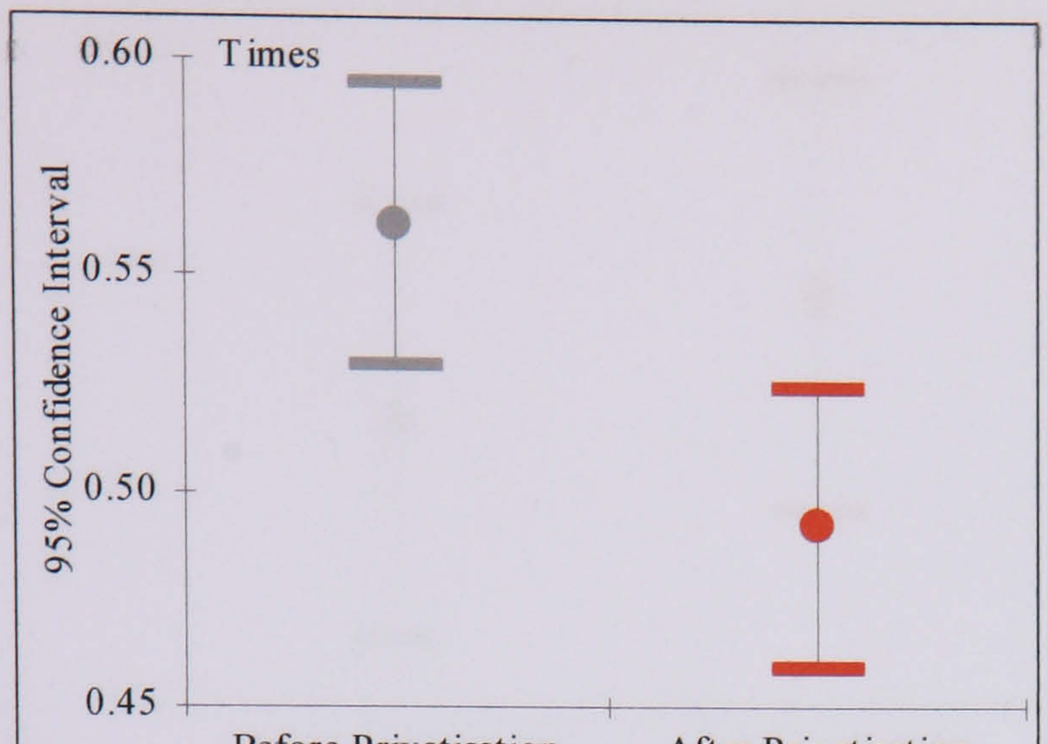
Figure 6.60: Error Bar Graph of Asset Utilization (WLU / Total Assets in '000) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 4.632 | 2.327 | .048 |

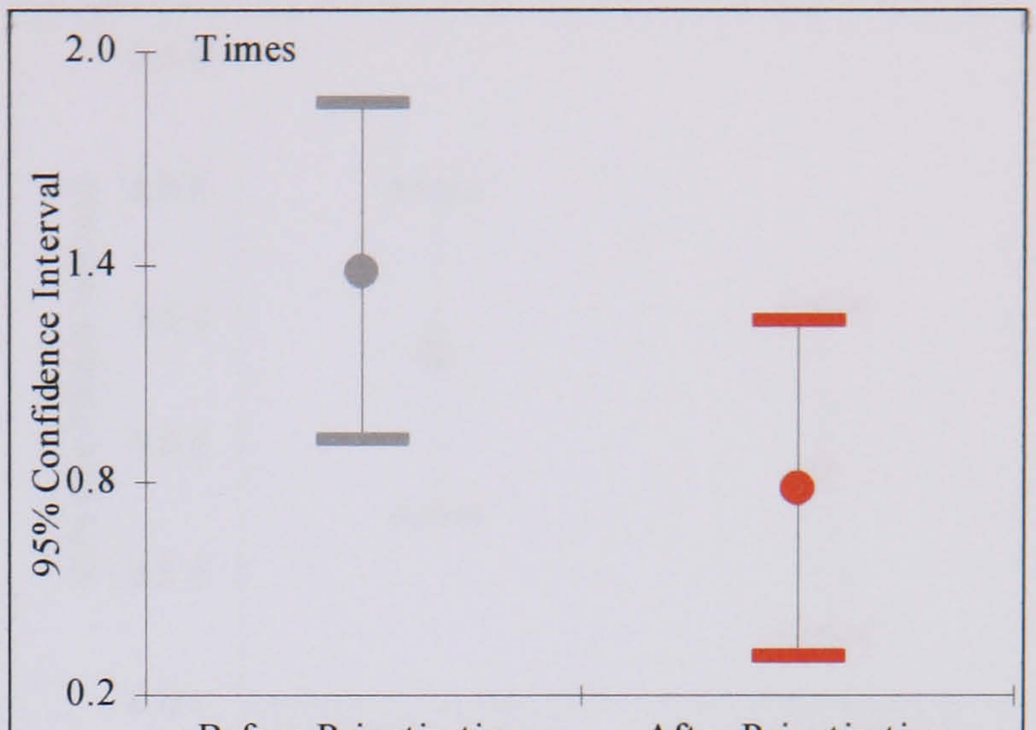
Depreciation cost per WLU (Figure 6.59) do not differ significantly before and after partial or full privatisation. The difference in asset utilization in terms of WLU over total assets (Figure 6.60) is statistically significant.

Figure 6.61: Error Bar Graph of Total Asset Turnover 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | .070 | 2.452 | .040 |

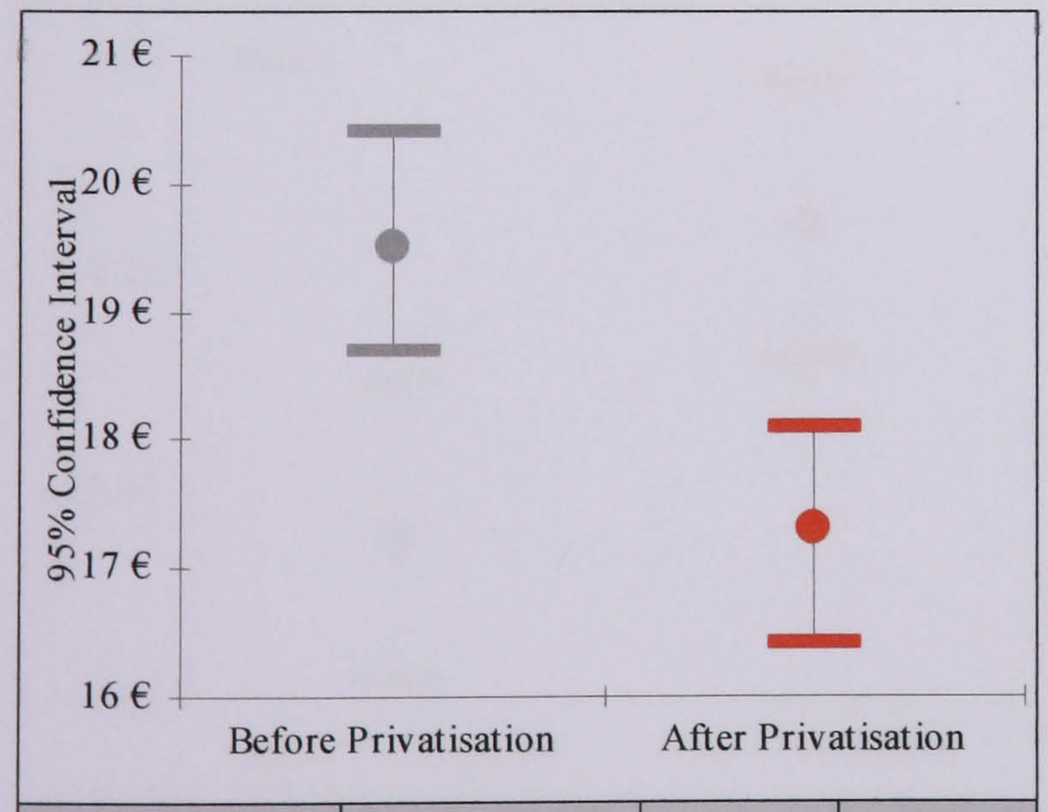
Figure 6.62: Error Bar Graph of Fixed Asset Turnover 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | .601 | 1.474 | .179 |

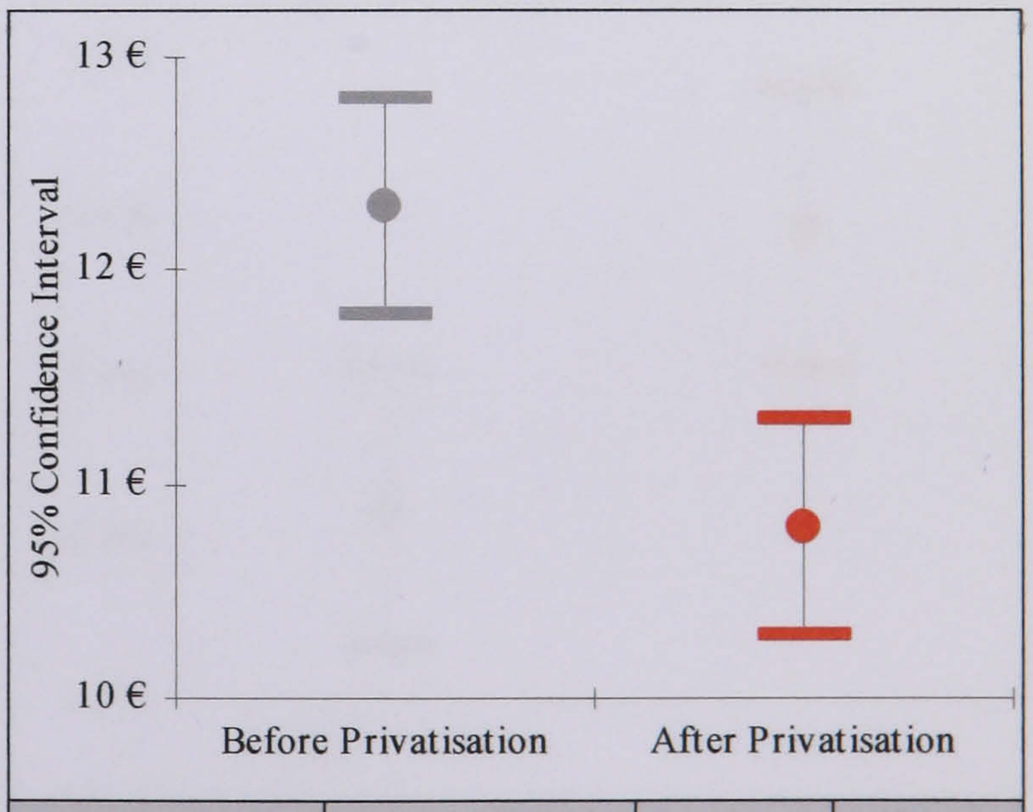
While the difference in total asset turnover (Figure 6.61) is significant prior to and after a change in ownership, fixed asset turnover (Figure 6.62) is not. The variance in fixed asset turnover is resulting in an overlap of the confidence intervals before and after partial or full privatisation.

Figure 6.63: Error Bar Graph of Inflation-Adjusted Total Revenue per WLU 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 2.28 € | 3.044 | .016 |

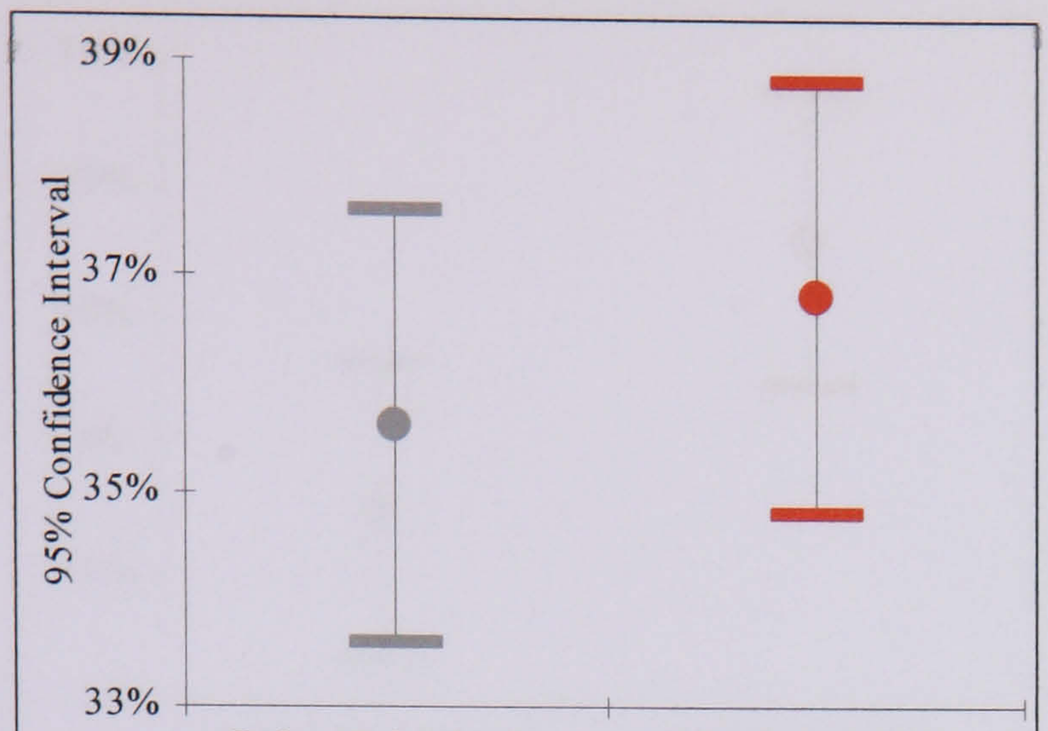
Figure 6.64: Error Bar Graph of Inflation-Adjusted Aeronautical Revenue per WLU 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 1.53 € | 3.352 | .010 |

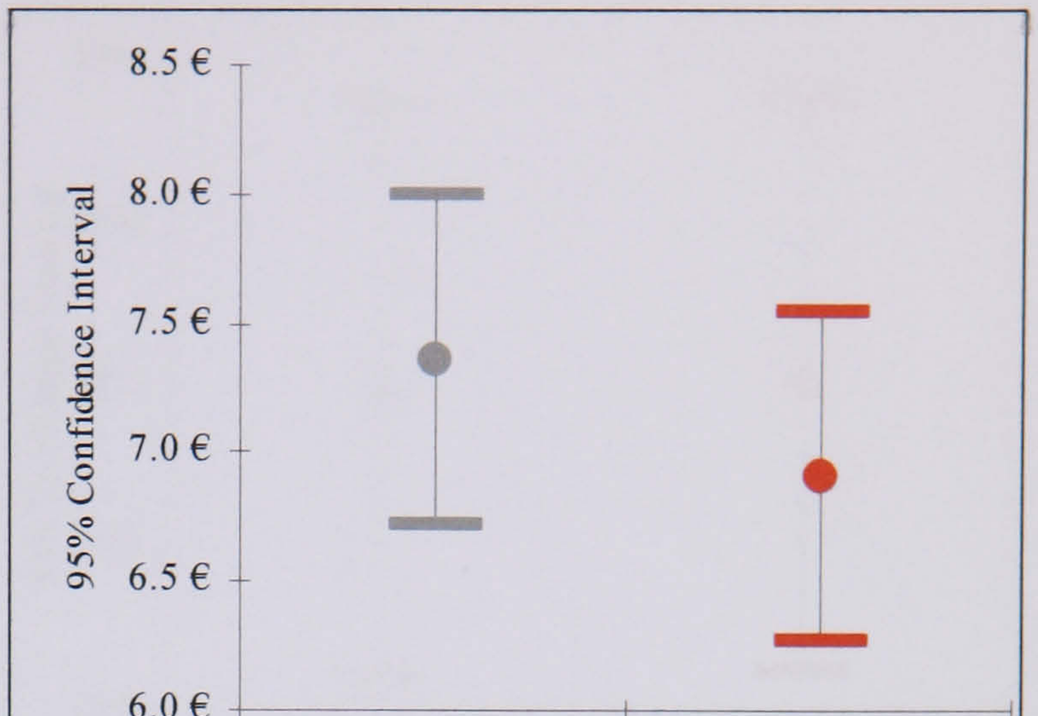
Both inflation-adjusted total unit revenues and aeronautical unit revenues (Figures 6.63 and 6.64) differ significantly before and after a change in ownership.

Figure 6.65: Error Bar Graph of Non-Aeronautical Share of Total Revenue 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -1.17% | -.669 | .522 |

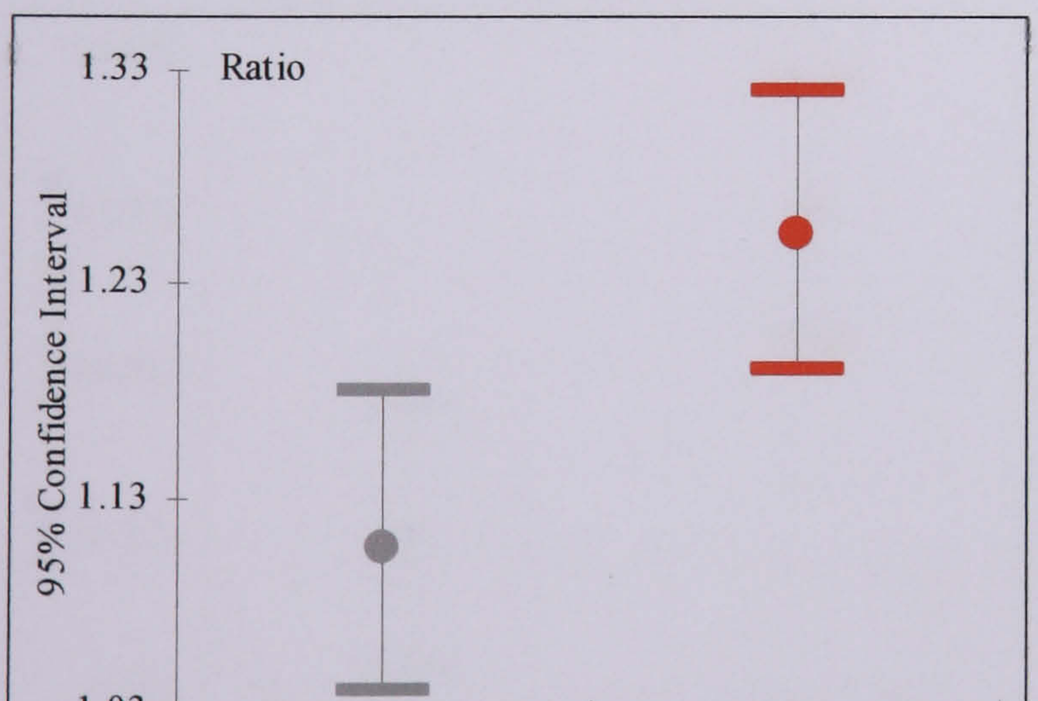
Figure 6.66: Error Bar Graph of Inflation-Adj. Commercial Revenue per Terminal PAX 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | .45 € | .813 | .440 |

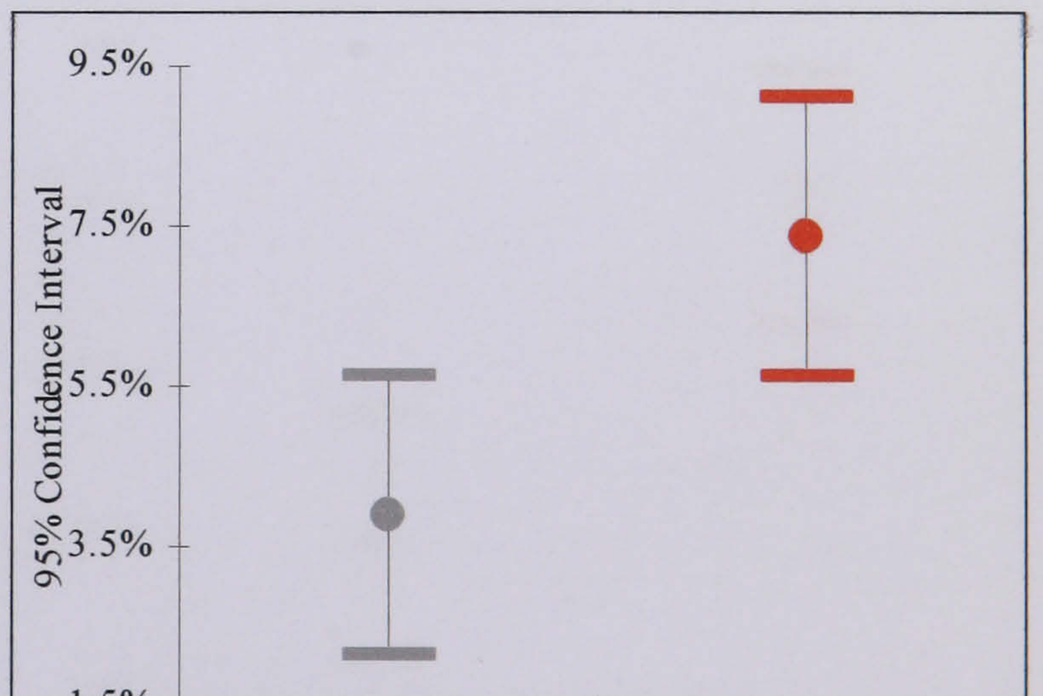
Due to the relatively high variability of the sample data there is a considerable overlap of the confidence intervals prior to and after partial or full privatisation for both variables. Therefore, neither the non-aeronautical share of total revenue (Figure 6.65) nor commercial revenue per passenger (Figure 6.66) differ significantly.

Figure 6.67: Error Bar Graph of the Revenue / Expenditure Ratio 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -.146 | -2.468 | .039 |

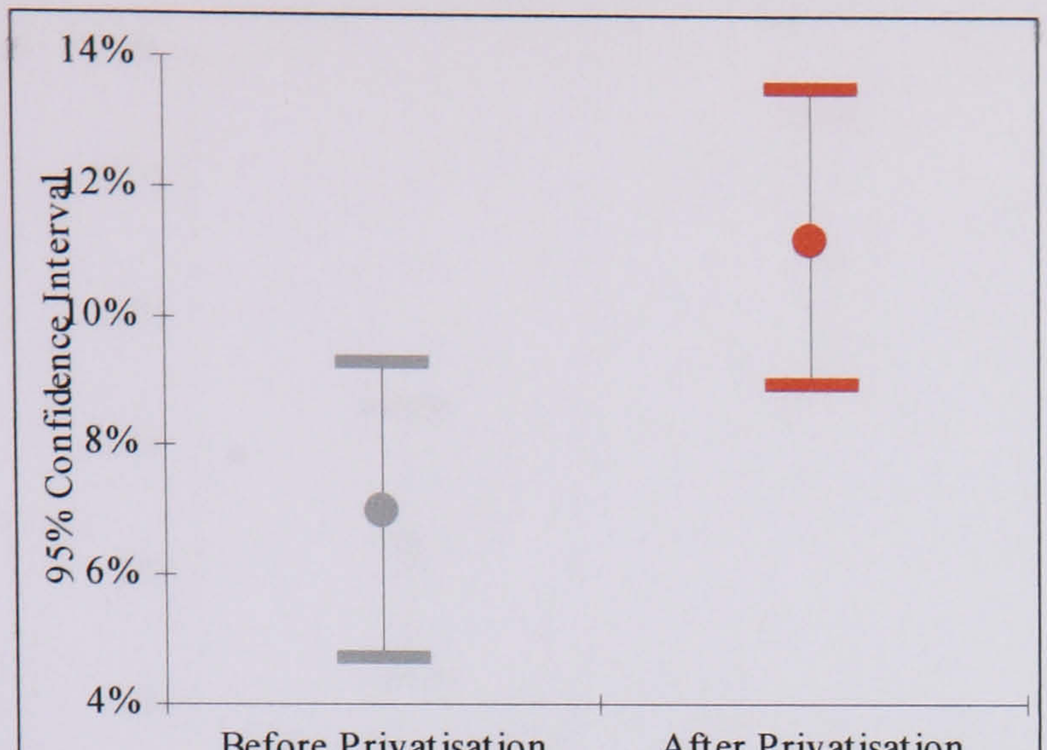
Figure 6.68: Error Bar Graph of Return on Total Assets (ROA) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -3.49% | -2.328 | .048 |

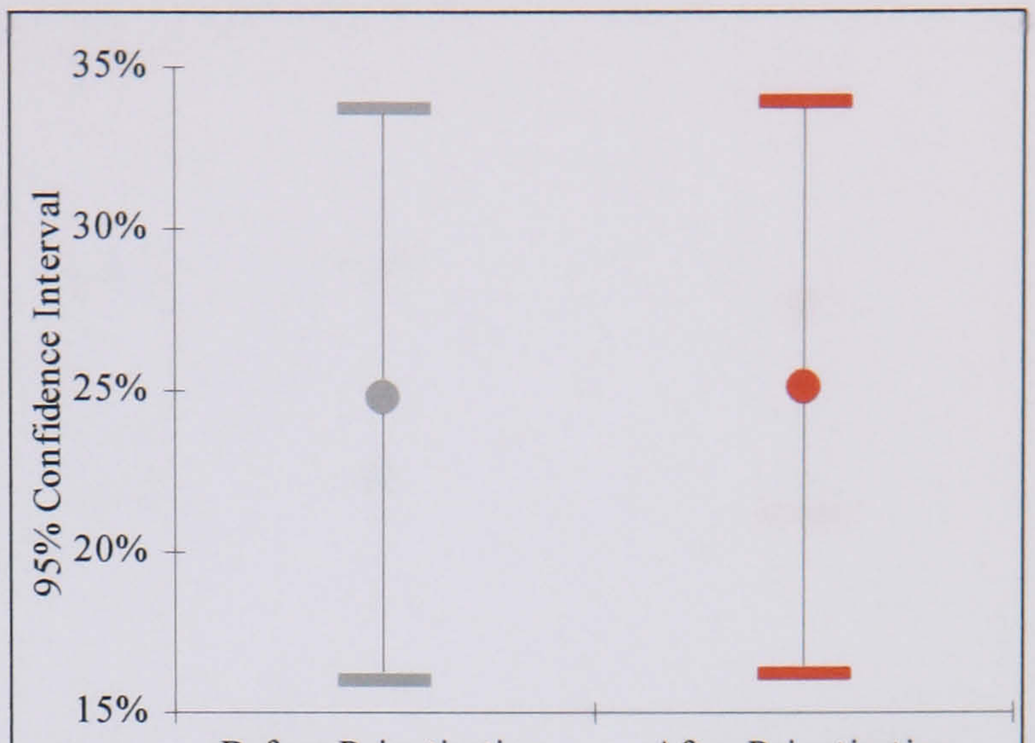
The RevEx ratio (Figure 6.67) and the ROA (Figure 6.68), in contrast, differ significantly in statistical terms before and after a change in ownership structure.

Figure 6.69: Error Bar Graph of Return on Capital Employed (ROCE) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -4.21% | -2.135 | .065 |

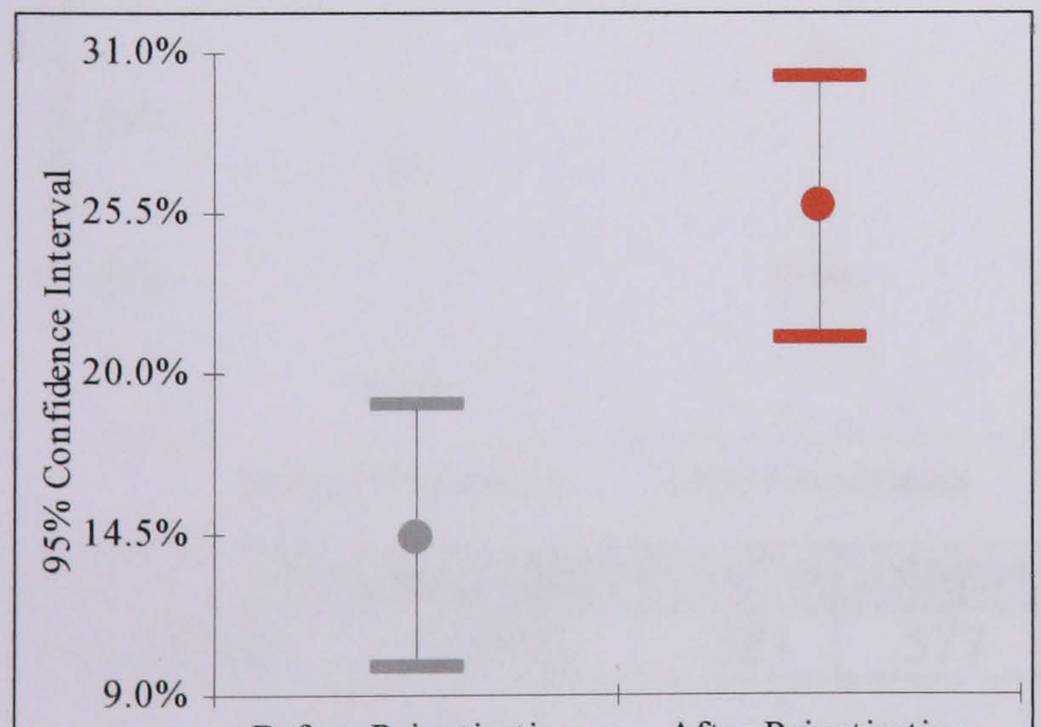
Figure 6.70: Error Bar Graph of Return on Net Assets (b.I.a.T.) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -.26% | -.034 | .974 |

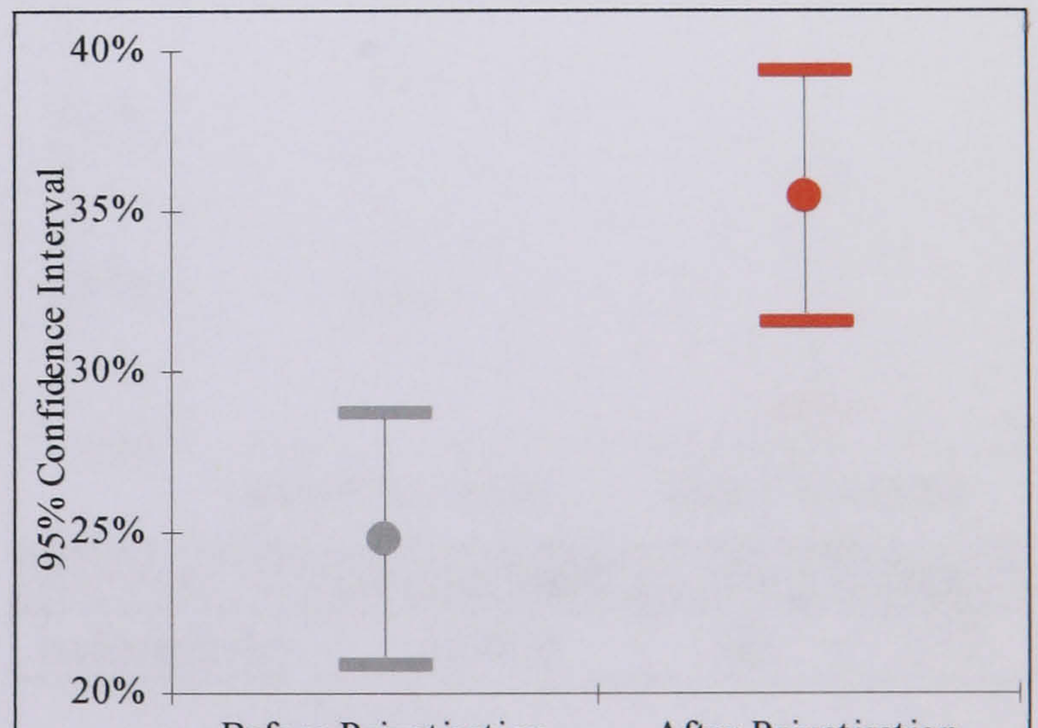
Although considerably apart, return on capital employed (Figure 6.69) does not meet the criteria of statistical significance on a 95% confidence level. Likewise, no significant difference was tested for the rates of return on net assets before interest and taxes (Figure 6.70), which are quite uniform.

Figure 6.71: Error Bar Graph of Operating Margin 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -11.26% | -2.879 | .021 |

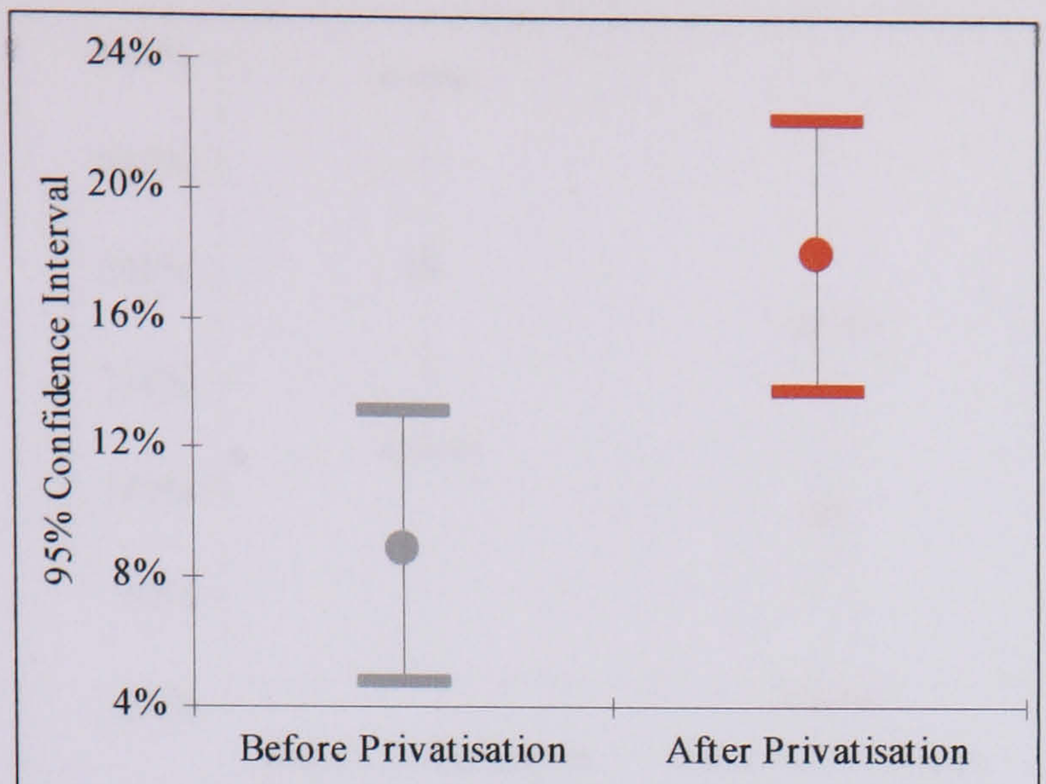
Figure 6.72: Error Bar Graph of EBITDA Margin 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -10.62% | -3.122 | .014 |

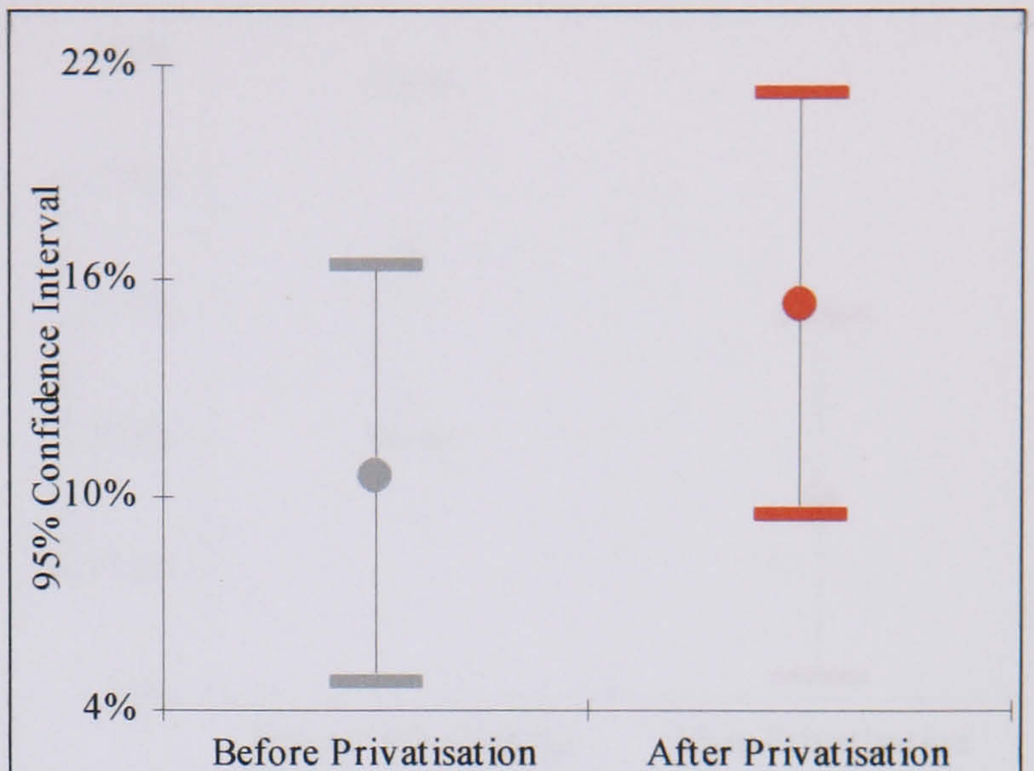
Both operating and EBITDA margin (Figures 6.71 and 6.72) of privatised sample airports are significantly higher than with airports under public ownership.

Figure 6.73: Error Bar Graph of Return on Total Revenue (ROS) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -9.03% | -2.509 | .036 |

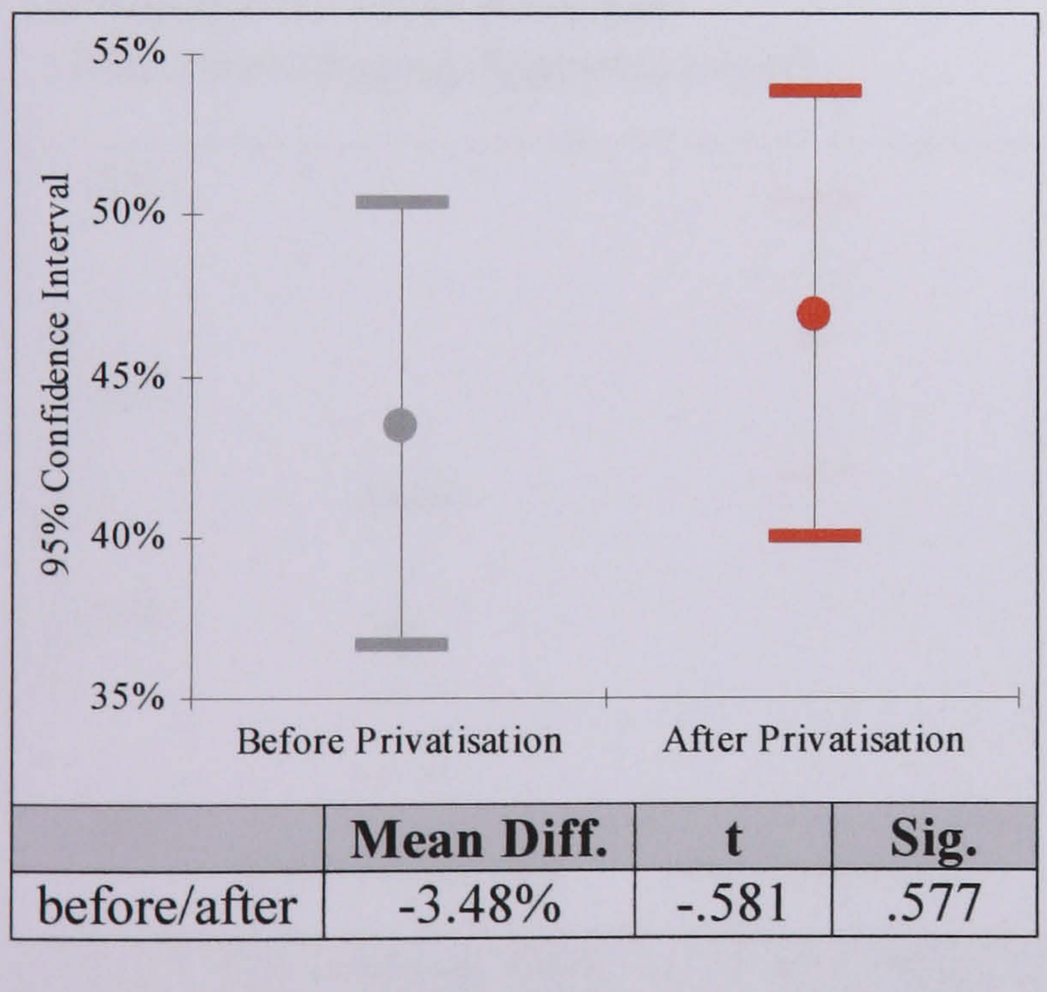
Figure 6.74: Error Bar Graph of Return on Shareholders' Funds (ROE) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -4.72% | -.931 | .379 |

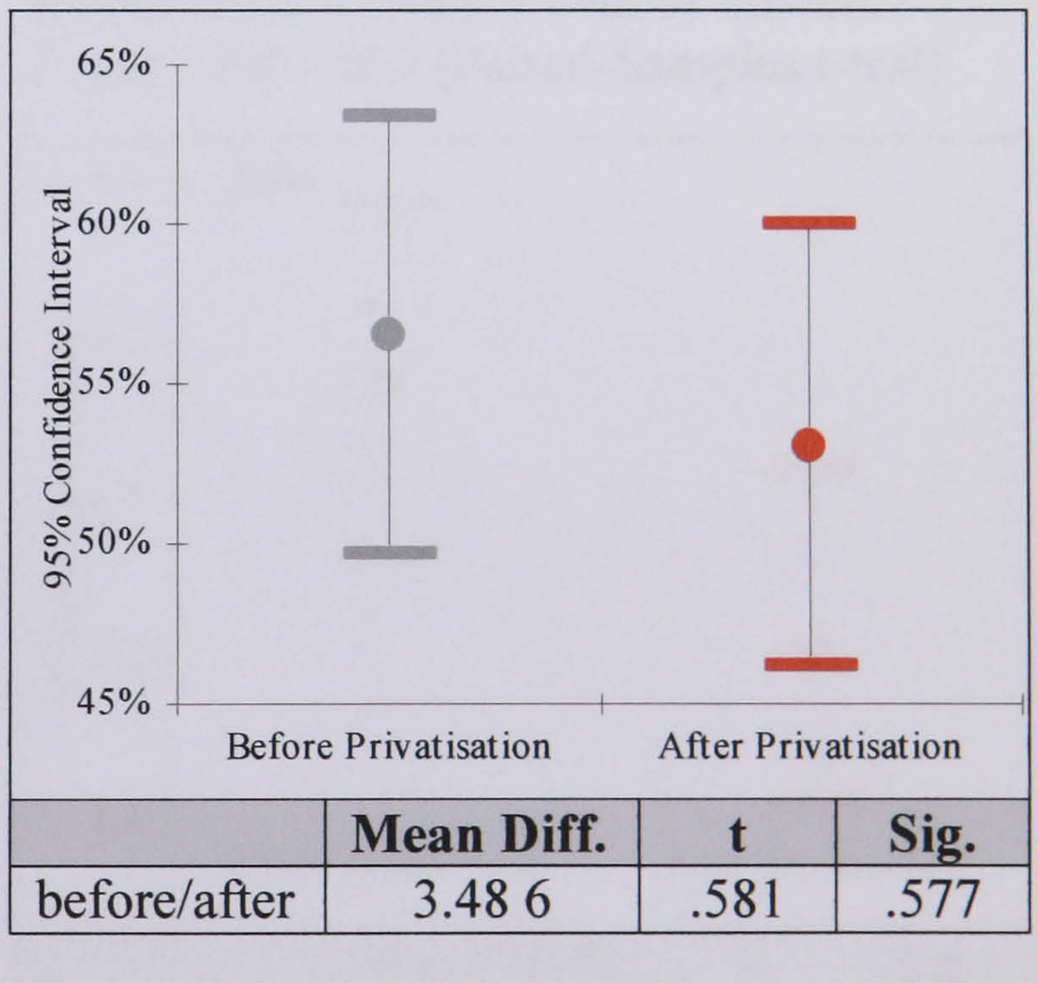
The ROS (Figure 6.73) has improved significantly after partial or full privatisation, whereas no significant difference was found for the ROE (Figure 6.74).

Figure 6.75: Error Bar Graph of Net Assets in Percent of Total Assets 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -3.48% | -.581 | .577 |

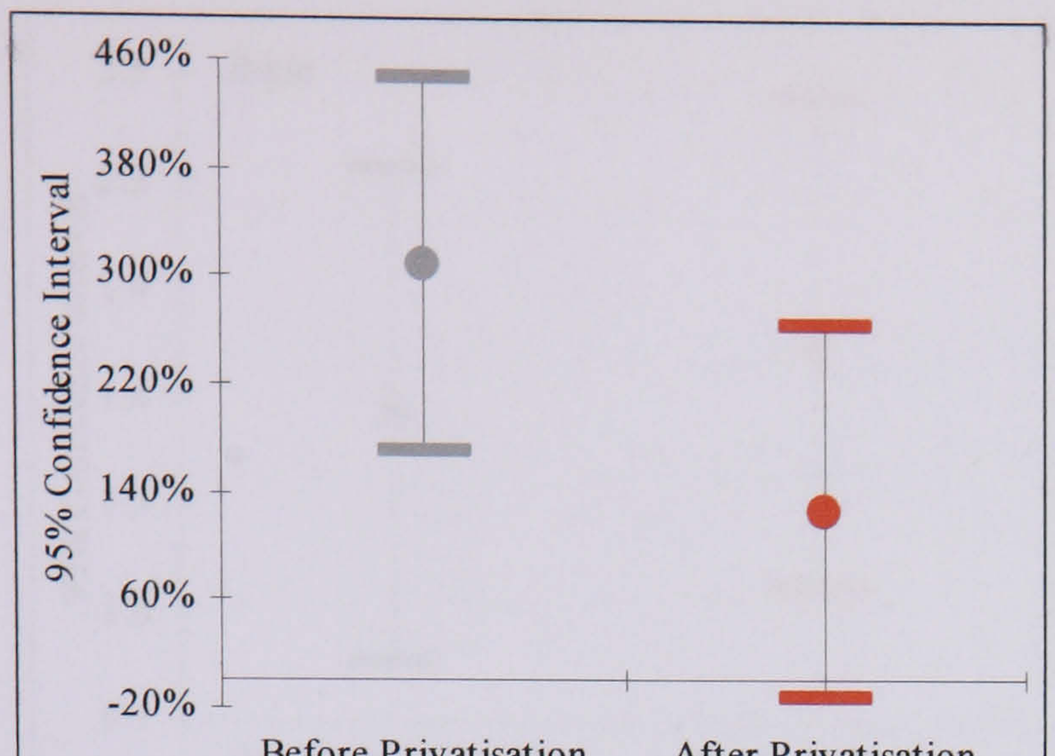
Figure 6.76: Error Bar Graph of Debt Ratio 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 3.48 6 | .581 | .577 |

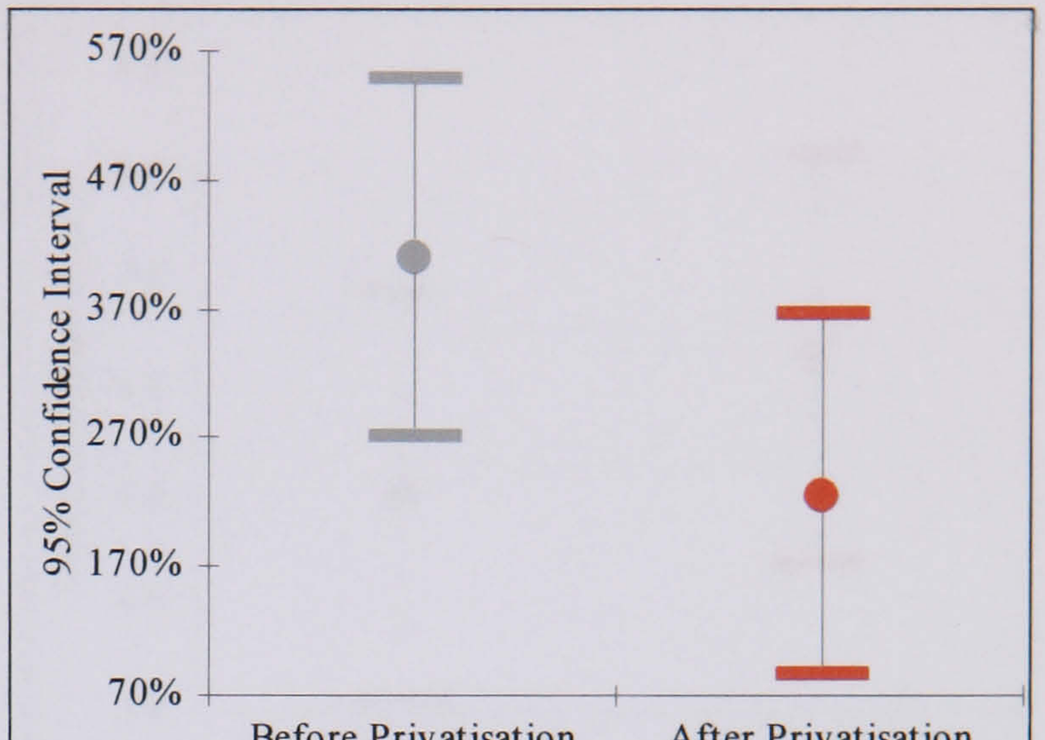
Both net assets in percent of total assets and debt ratio (Figures 6.75 and 6.76) did not test significantly different prior to and after partial or full privatisation. Although group means are certainly different, it is again the comparatively high data variance which is resulting in a considerable overlap of the respective confidence intervals.

Figure 6.77: Error Bar Graph of Gearing (Debt / Equity Ratio) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 183% | 1.523 | .166 |

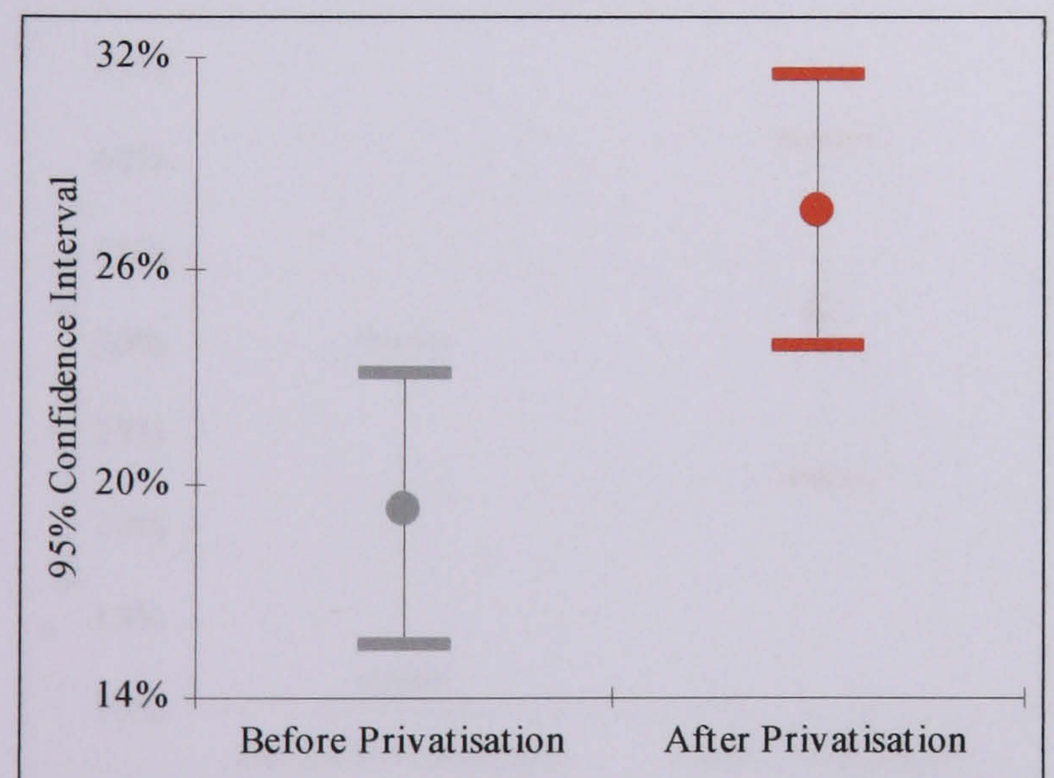
Figure 6.78: Error Bar Graph of Financial Leverage 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 183% | 1.523 | .166 |

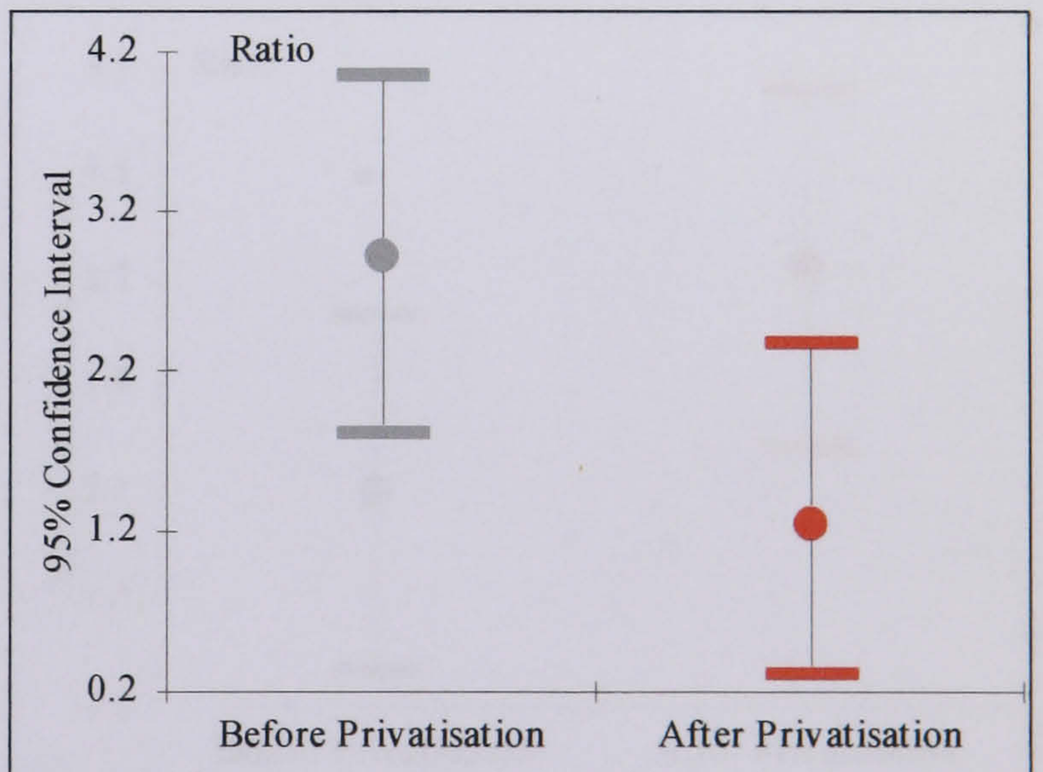
The same applies to gearing and financial leverage (Figures 6.77 and 6.78). Although both variables are considerably decreasing and group means are far apart after a change in ownership, the confidence intervals are still overlapping on a 95% level.

Figure 6.79: Error Bar Graph of Cash Flow in Percent of Total Revenue 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -8.38% | -2.532 | .035 |

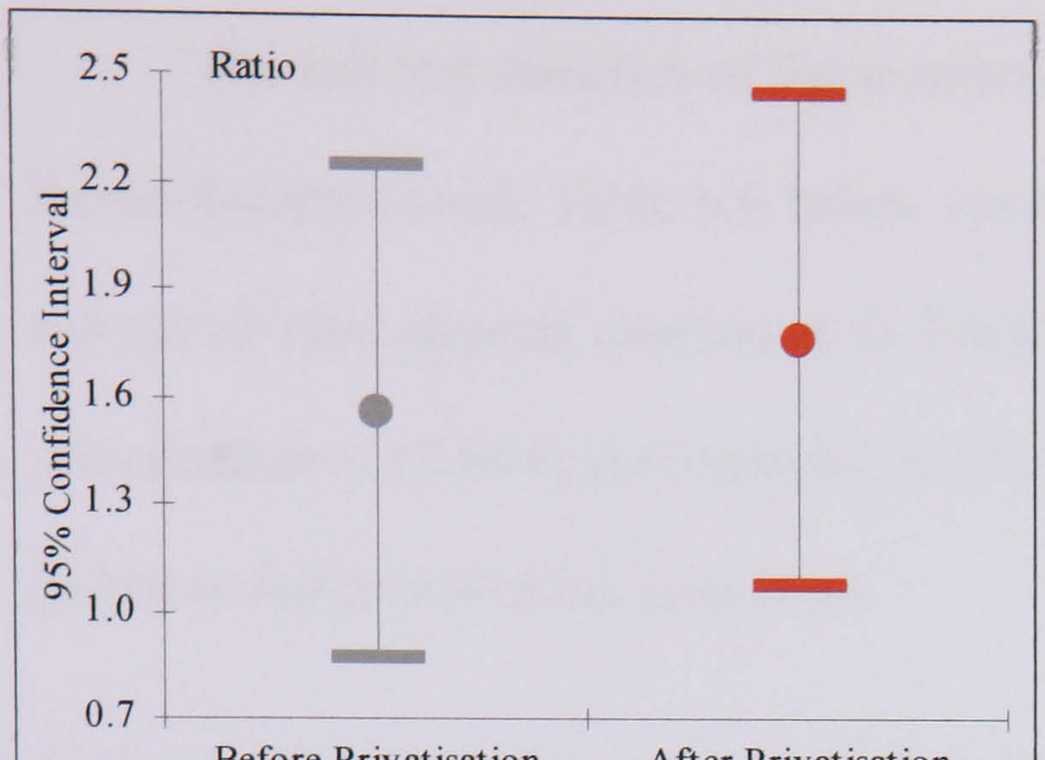
Figure 6.80: Error Bar Graph of Total Revenue per Currency Unit of Shareh. Funds 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | 1.670 | 1.716 | .124 |

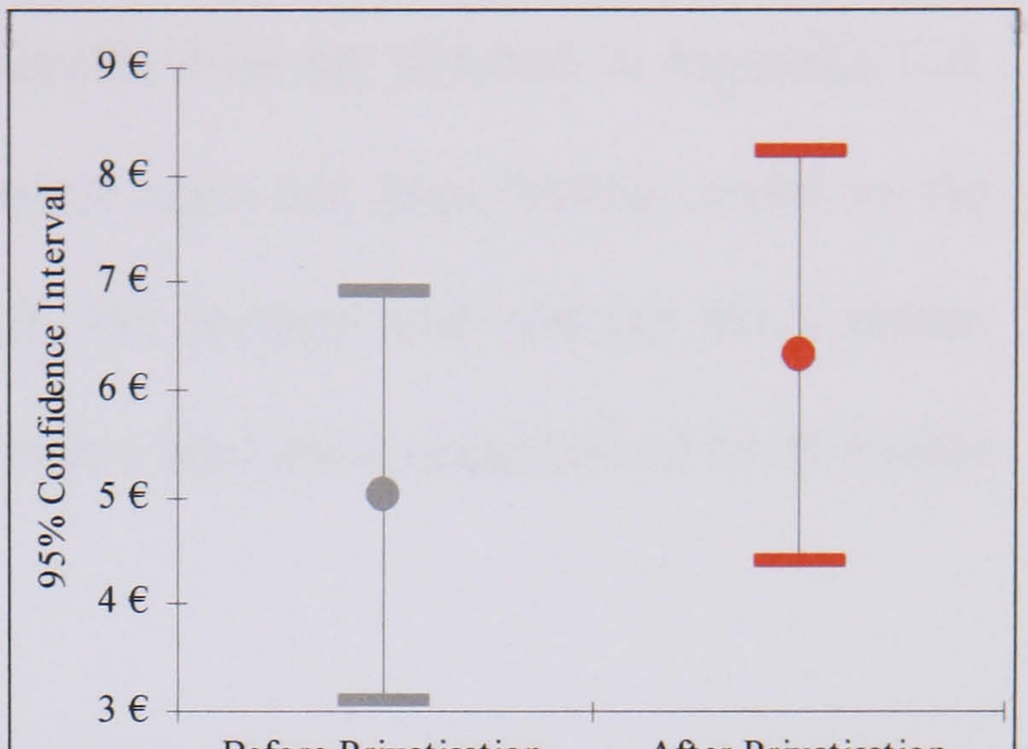
While there is a significant difference in cash flow as percentage of total revenue (Figure 6.79), the difference in total revenue per currency unit of shareholders' funds (Figure 6.80) prior to and after privatisation is not significant in statistical terms.

Figure 6.81: Error Bar Graph of Investment Coverage Ratio (CF / Capital Expenditure) 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -.210 | -.352 | .734 |

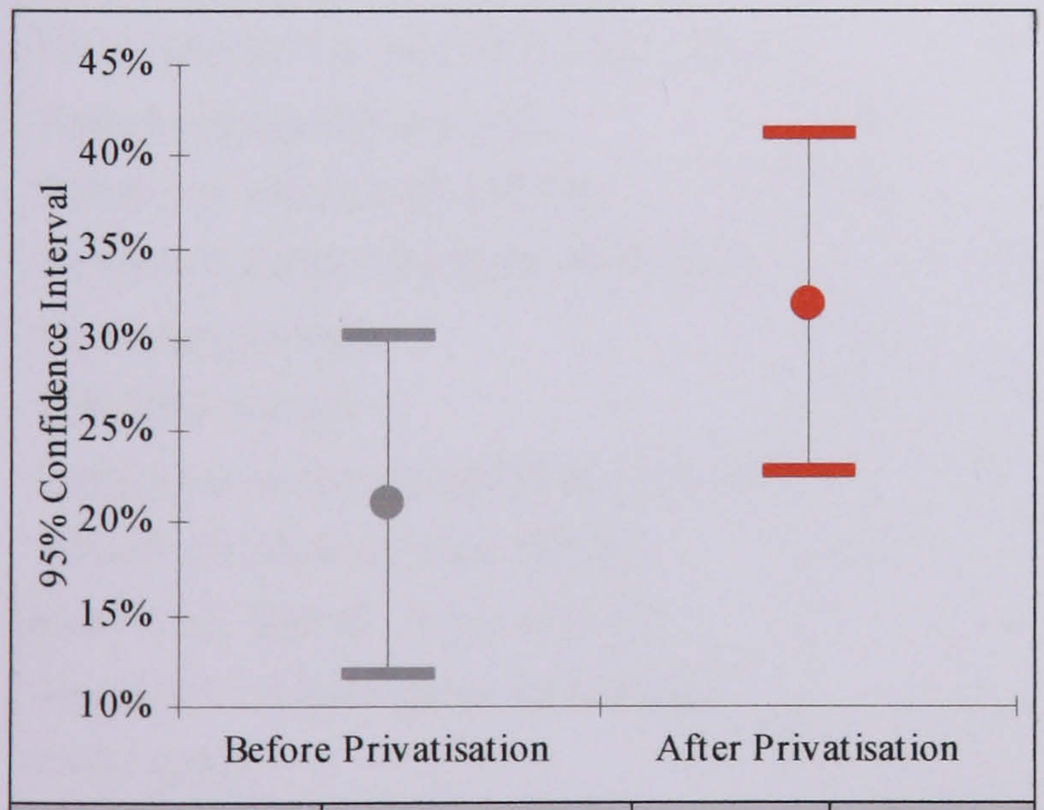
Figure 6.82: Error Bar Graph of Inflation-Adj. Capital Expenditure per Terminal PAX 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -1.30 € | -.787 | .454 |

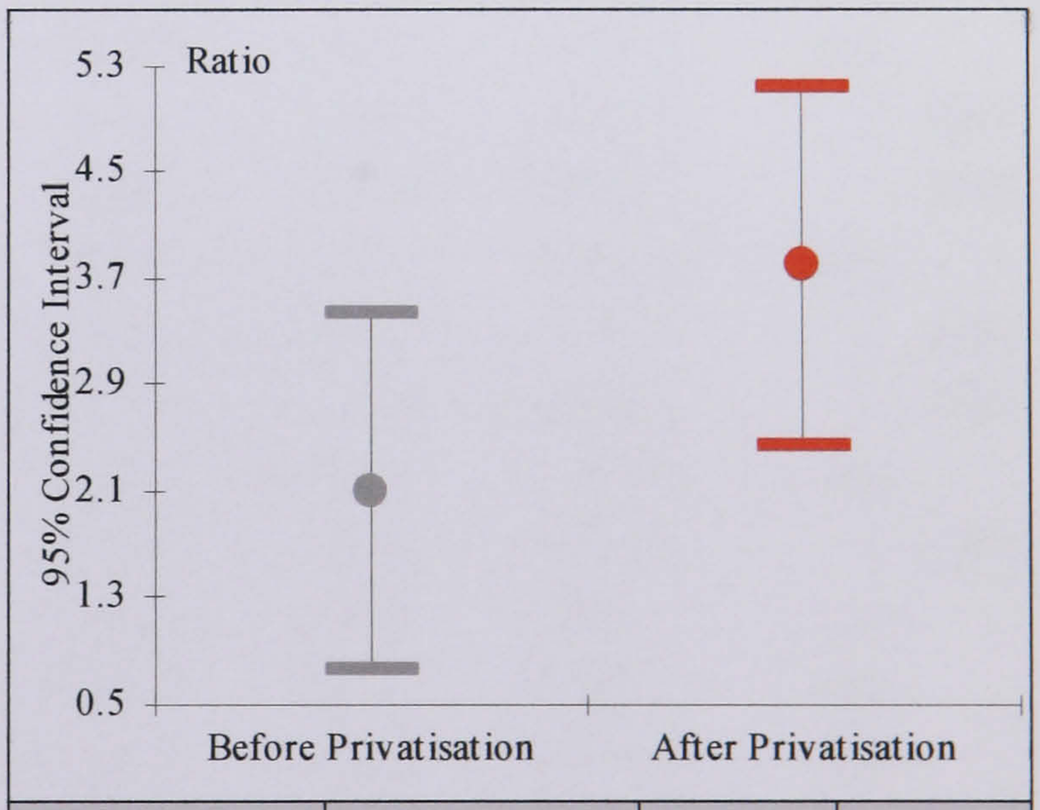
The investment coverage ratio (Figure 6.81) and the capital expenditure per terminal passenger (Figure 6.82) did not test significant. Although group means are noticeably apart, it is again the high data variability which prevents statistical significance.

Figure 6.83: Error Bar Graph of Capital Expenditure in Percent of Total Revenue 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -11.02% | -1.369 | .208 |

Figure 6.84: Error Bar Graph of Capital Expenditure to Depreciation Ratio 1990-1999 (Paired-Samples t-test)




| | Mean Diff. | t | Sig. |
|---|---|---|---|
| before/after | -1.690 | -1.446 | .186 |

Similarly, no significant difference was measured for capital expenditure as percentage of total revenue and the capital expenditure to depreciation ratio (Figure 6.83 and 6.84). Both variables increase markedly after partial or full privatisation but the level

of statistical significance is not met since there is again an overlap of the respective confidence intervals in both cases.

The full test statistics of the matched-samples t-test are attached in Appendix C.4, Paired-Samples t-test. Table 6.9 below summarizes again the main findings based on the sub set of nine airports mentioned in Table 6.8. The average total cost per WLU before privatisation of 17.86 €, for example, is 3.51 € higher than the average cost of 14.35 € after partial or full privatisation, and so on.

Table 6.9: Results of Paired-Samples t-Test based on 9 Airports

| Dependent Variables / Ratios | Ownership Signific. | | Mean Value | | | Mean Differ-ence | Best in Class | |
|---|---|---|---|---|---|---|---|---|
| | sig. | not sig. | Before Priv. | vs | After Priv. | = | Before Priv. | After Priv. |
| Total cost per WLU (ind. to 1995) | ◈ | | 17.86 € | | 14.35 € | 3.51 € | | after |
| Operating cost per WLU (ind. to'95) | ◈ | | 16.90 € | | 13.12 € | 3.78 € | | after |
| Depreciation cost per WLU (ind. '95) | | ◇ | 2.08 € | | 1.75 € | .33 € | n/a | |
| Asset utilization (WLU/total assets '000) | ◈ | | 35.251 | | 30.619 | 4.632 | before | |
| Total asset turnover | ◈ | | .562 | | .492 | .070 | before | |
| Fixed asset turnover | | ◇ | 1.381 | | .780 | .601 | n/a | |
| Total revenue per WLU (ind. to '95) | ◈ | | 19.53 € | | 17.25 € | 2.28 € | before | |
| Aeron. revenue per WLU (ind. to'95) | ◈ | | 12.32 € | | 10.79 € | 1.53 € | before | |
| Non-aeronautical share of total rev. | | ◇ | 35.63% | | 36.80% | -1.17% | n/a | |
| Commercial rev. per PAX (ind. '95) | | ◇ | 7.36 € | | 6.91 € | .45 € | n/a | |
| Revenue/expenditure ratio | ◈ | | 1.107 | | 1.253 | -.146 | | after |
| Return on total assets (ROA) | ◈ | | 3.88% | | 7.37% | -3.49% | | after |
| Return on capital employed (ROCE) | | ◇ | 6.99% | | 11.20% | -4.21% | n/a | |
| Operating margin | ◈ | | 14.42% | | 25.68% | -11.26% | | after |
| EBITDA margin | ◈ | | 24.79% | | 35.41% | -10.62% | | after |
| Return on net assets (RONA b.I.a.T) | | ◇ | 24.82% | | 25.08% | -.26% | n/a | |
| Return on total revenue (ROS) | ◈ | | 8.94% | | 17.97% | -9.03% | | after |
| Return on shareh' funds (ROE) | | ◇ | 10.60% | | 15.32% | -4.72% | n/a | |
| Net assets in percent of total assets | | ◇ | 43.45% | | 46.93% | -3.48% | n/a | |
| Debt ratio | | ◇ | 56.54% | | 53.06% | 3.48% | n/a | |
| Gearing (Debt/Equity Ratio) | | ◇ | 309% | | 126% | 183% | n/a | |
| Financial leverage | | ◇ | 409% | | 226% | 183% | n/a | |
| Cash flow in percent of total revenue | ◈ | | 19.32% | | 27.70% | -8.38% | | after |
| Investment coverage ratio (CF/capex) | | ◇ | 1.551 | | 1.761 | -.210 | n/a | |
| Total revenue/shareholders' funds | | ◇ | 2.922 | | 1.252 | 1.670 | n/a | |
| Capital expendit. per PAX (ind. '95) | | ◇ | 5.02 € | | 6.32 € | -1.30 € | n/a | |
| Capital expendit. in % of total rev. | | ◇ | 20.94% | | 31.96% | -11.02% | n/a | |
| Capital expendit. to depreciation ratio | | ◇ | 2.106 | | 3.796 | -1.690 | n/a | |

Statistically significant differences were measured for twelve key ratios such as:

- Total cost per WLU (indexed to 1995),
- operating cost per WLU (indexed to 1995),
- asset utilization in terms of WLU/total assets in `000,
- total asset turnover,
- total revenue per WLU (indexed to 1995),
- aeronautical revenue per WLU (indexed to 1995),
- the revenue/expenditure ratio,
- return on total assets (ROA),
- operating (EBIT) margin,
- EBITDA margin,
- return on total revenue (ROS) and
- cash flow in percent of total revenue.

Total unit cost and operating cost, the revenue/expenditure ratio, return on total assets (ROA), operating and EBITDA margin, cash flow in percent of total revenue and return on sales (ROS), all have significantly improved after partial or full privatisation. Structural changes after an increase in the degree of privatisation appear to produce improvements in operating efficiency and profitability. The revenue-generating ability regarding total unit revenues as well as aeronautical unit revenues appears to be reduced in contrast to the period before partial or full privatisation, which is consistent with the findings of financial ratio analysis and the independent t-test.

All results of the paired-samples t-test conform to the independent samples t-test, although the total number of twelve significant correlations may appear to be comparatively low at first sight. It needs to be noted, however, that this is due to the relatively small number of cases (and thus degrees of freedom) of the sub set. Wherever no statistically valid relationship was found, the coefficient sign of any other ratio – indicating

the direction of change – is compliant with the results of the independent t-test based on the total sample of 35 airports. The exceptions to this rule are the non-aeronautical share of total revenue and RONA (b.I.a.T.), where the matched-samples test reveals improved ratios after partial or full privatisation as well.

In general, the results established by the dependent-samples design and the independent samples t-test are consistent and confirm each other. Still, due to the comparatively small size of the sub set of sample airports experiencing a change in ownership and the relatively high variability of sample data, the repeated measures analysis of an expanded matched-sample over an extended period of time may be an area worthwhile considering for further research.

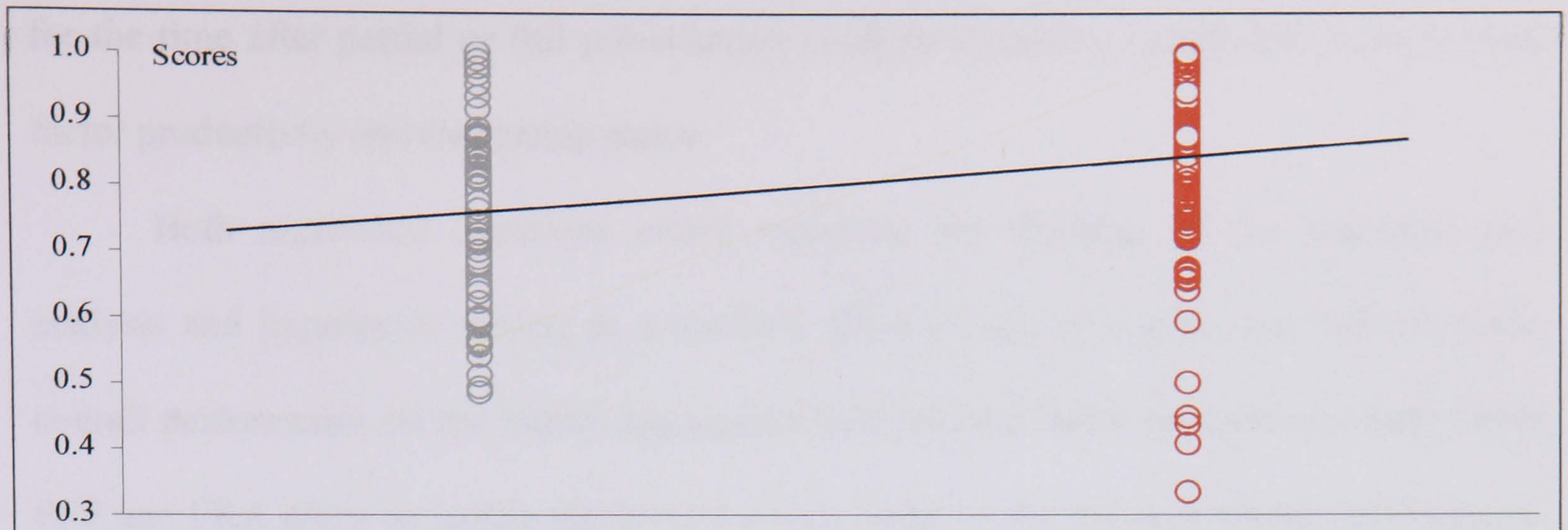
### 6.5 Testing DEA Results

Since the DEA results are overall indices of (in)efficiency of the individual sample airports relative to each other on an annual basis, they had not been subjected to the independent and paired-samples t-tests. Therefore, the DEA scores established in the course of the analysis of total factor productivity (section 5.2) shall now be validated by regression analysis using the dummy variable 'ownership' as predictor.

In addition, the DEA scores prior to and after partial or full privatisation will be subjected to a regression analysis using the dummy variable 'before/after' change in ownership status as categorical variable. All other parameters are identical to the conditions of the paired-samples t-test.

Although regression does not establish a cause-effect-relationship, it actually allows to go one step beyond the DEA results produced and analysed so far. The first regression model (Figure 6.85) uses DEA scores of publicly owned and privatised sample airports as dependent variables and ownership structure as independent variable or predictor. The intercept or constant is labelled $b_0$ and the regression coefficient or slope is labelled $b_1$.

Figure 6.85: Regression Analysis on Total Sample DEA Scores

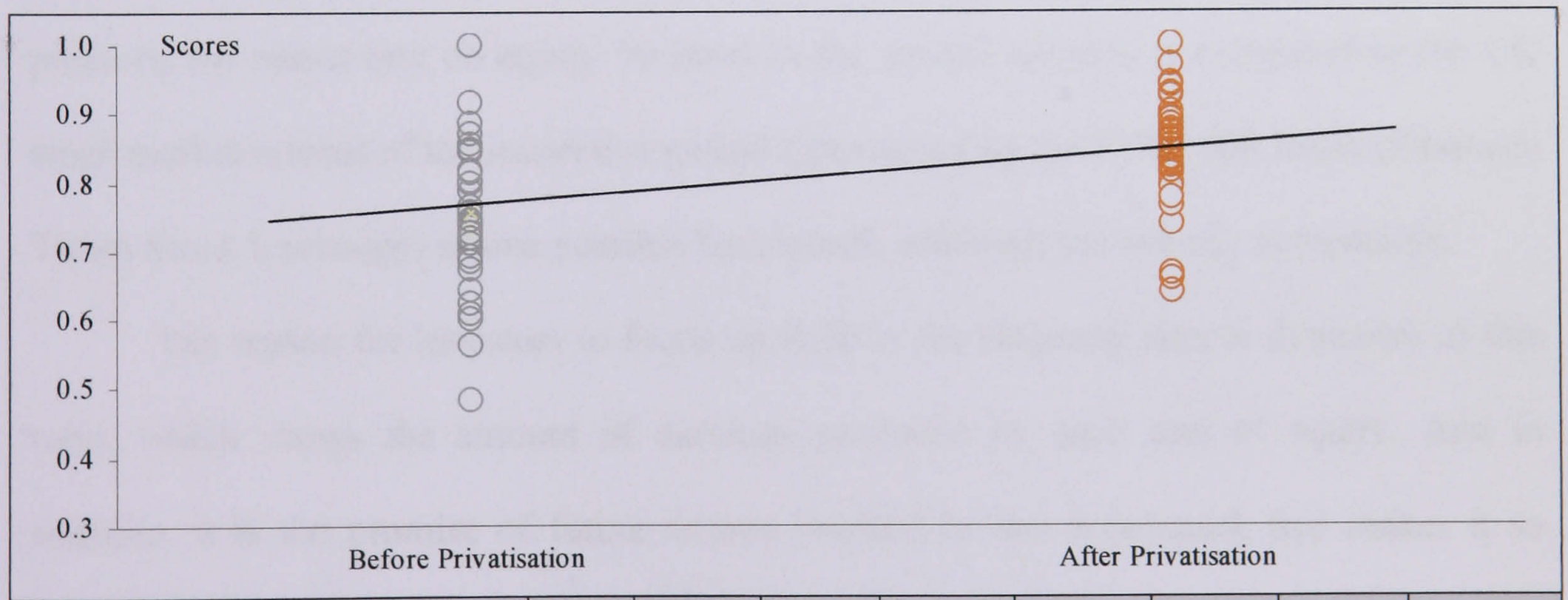



| Independent | Dependent | Mth | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|---|
| OWNER1 | DEASCORE | LIN | .103 | 326 | 37.53 | 6.126 | .000 | .7607 | .0857 |

The result shows that DEA scores – the index for total factor productivity – are highly significantly positively correlated to the ownership structure of sample airports.

The second regression model (Figure 6.86) uses DEA scores of the sub set of nine airports experiencing a change in ownership as dependent variable and 'before/after' partial or full privatisation as predictor or independent variable.

Figure 6.86: Regression Analysis on Matched-Samples DEA Scores




| Independent | Dependent | Mth | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|---|
| BEFAFTER | DEASCORE | LIN | .117 | 88 | 11.71 | 3.422 | .001 | .7743 | .830 |

The result of the second regression analysis reveals that DEA scores of sample airports experiencing a change in ownership structure are also significantly correlated with

a change from public to private ownership. Improved DEA scores of 'financial efficiency' for the time after partial or full privatisation confirm a positive correlation between total factor productivity and ownership status.

Both regression equations above reconfirm the findings of the extended data analysis and hypotheses testing in a nutshell. DEA scores, of course, are indices of the overall performance on the highly aggregated level of total factor productivity only, while PFP and FRA allow to isolate the factors which make up for the performance differences. The merit of TFP, in turn, is that it spares the difficult interpretation of a comprehensive set of indicators and ratios which are focusing on individual areas exclusively and may even appear to be partially contradicting.

### 6.6 Testing Return on Equity

Up to this point, this study focused on the first hypothesis stated at the outset that partially or fully privatised European commercial airports operate more efficiently than others. In order to test the second hypothesis that partially or fully privatised European commercial airports are an attractive investment as compared to alternative capital projects, the return rate on equity invested in the sample airports is compared to the UK stock market returns of the respective period represented by the FTSE 100 Index (Financial Times Stock Exchange) as one possible benchmark, although not entirely comparable.

The reason for investors to focus on ROE is the elegantly simple dynamics of this ratio, which shows the amount of earnings produced by each unit of equity. And in addition, it is the promise of future returns implicit in this benchmark that makes it so beguiling. ROE gives the investor a markedly handy gauge to measure business and management performance (Teitelbaum 1996).

From the investor's standpoint, an airport represents an attractive investment when it is a profitable company delivering above market or at least adequate rates of return,

given a comparable risk profile. The return rates on equity of the sample airport companies examined in this research are assembled in Table 6.10 as unweighted long-term averages for the period of 1990 through 1999.

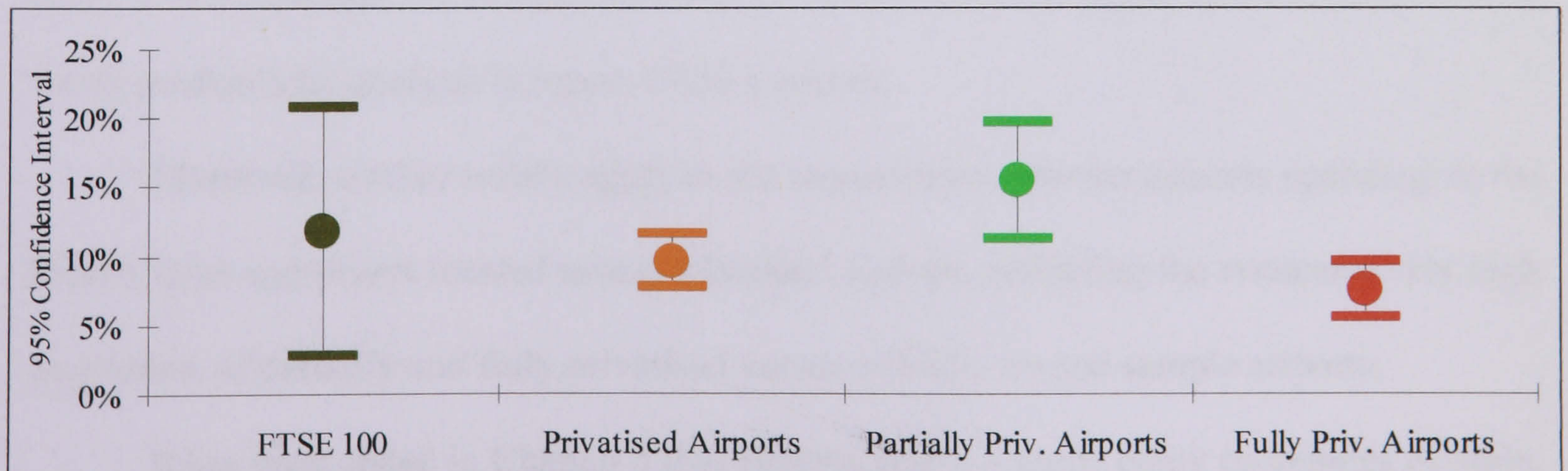
Table 6.10: Return on Equity in the Airport Sector (Unweighted Mean of Sample Airports)

| **Airport Grouping** | **Average ROE for the Period 1990-1999** |
|---|---|
| Total Sample | 8.67% |
| Publicly Owned Airports | 8.00% |
| Privatised Airports | 9.63% |
| Partially Privatised Airports | 15.44% |
| Fully Privatised Airports | 7.57% |
| Airports in the British Isles | 8.86% |
| BAA Owned Airports | 9.22% |
| UK/Irish Airports | 8.66% |
| Airports in Mainland Europe | 8.47% |
| German Airports | 1.35% |
| Other European Airports | 12.40% |
| Airport Systems | 3.86% |

Note: BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
BAA Group is excluded from average to avoid double counting.

The ten-year average return rates on equity differ considerably between the sub groupings, most noticeable regarding the group of partially privatised airports. An independent samples t-test on the return rates on equity generated by privatised sample airports compared to achievable stock market returns of 11.77% p.a. on average as per the FTSE 100 Index reveals the results shown in Figure 6.87 (Ryland 2000).

Figure 6.87: Average ROE of Sample Airports and Stock Market Returns 1990-1999




| **Investment** | **Std. Deviation** | **Mean Difference** | **t** | **Significance** |
|---|---|---|---|---|
| FTSE 100 | 12.5086% | 2.14% | .589 | .557 |
| Privatised Airports | 10.9790% | | | |

No significant difference was measured between an investment in FTSE 100 equities (11.77%) or privatised airports (9.63%) for the period of 1990 through 1999 on a 95% confidence level. The graph also displays the average return rates on equity of partially privatised (15.44%) and fully privatised (7.57%) sample airports. It illustrates that neither privatised sample airports as a whole nor the sub grouping of fully privatised ones are specifically attractive from an investor's point of view. Only partially privatised sample airports delivered a higher average rate of return on equity as compared to an alternative investment at the stock exchange for the period under consideration.

## 6.7 Summary

The extended data analysis reveals economically meaningful and statistically significant differences between publicly owned and privatised airports for more than 71% of the total indicators and ratios tested. Furthermore, it shows that privatised airports do not form a homogeneous group but show evident structural differences between partially privatised and fully privatised companies.

This was already pointed to by the initial exercise of establishing relationships for unit cost and revenue, capital structure and productivity, profitability and return rates, using 'ownership' as a dummy variable. The independent samples and paired-samples t-tests confirm these preliminary findings for the majority of analysed ratios in very detail. Both of their findings are in turn reconfirmed by regression analyses on the results of total factor productivity analysis in terms of DEA scores.

Moreover, similar results apply to the comparison between airports operating in the British Isles and others located across Mainland Europe, reflecting the comparatively high proportion of partially and fully privatised versus publicly owned sample airports.

It has been stated in Chapter 5 that airports below 4 mppa enjoy economies of scale, while EBITDA and EBIT per WLU appear to be positively volume driven, most notably

with airports beyond 20 mppa. In order to explore the impact of traffic volume and composition, additional regressions have been run to test for correlations between airport size in terms of total WLUs and the share of international terminal passengers as dependent variables, and 'ownership' as predictor. Since no statistically valid relationship was found on a 95% significance level, it may be concluded that traffic volume and/or mix are not likely to be causal for the results of the t-tests above.

The major differences between sample airports lie in operating efficiency, investment activities and corresponding asset utilization and capital structure. Whereas privatised airports are more cost efficient, publicly owned airports generate comparatively higher total revenue per work load unit. In terms of operating margin and RevEx, however, the partially and fully privatised companies are ranking higher on average.

Regarding the capital structure and financing of their assets, respectively, the publicly owned airports appear to have a significant advantage. Due to their government-backed and ultimately state guaranteed credit standing, they appear to be in a position to assume more debt relatively to their respective shareholders' funds. This, in turn, results in considerably higher gearing and ultimately financial leverage, compensating for the comparatively low ROA. Financial leverage is the use of fixed financing costs (in terms of interest payments) by the company; it is acquired by choice and used as a means of increasing the return to common shareholders.

According to the Du Pont equation, the return on equity can be expressed as the product of return on assets times financial leverage. Based on the above, fully privatised airports cannot translate their improved operating efficiency into higher return rates on equity – which paradoxically are as attractive to the prospective investor as low debt and gearing.

In this respect, the 'hybrid' partially privatised airports appear to find themselves in an intermediate position, the most significant example for this being an outstanding

15.44% ROE for the ten-year average. In terms of cost efficiency, revenue generation and financing of their assets, they appear to combine the best of both worlds. Besides potential synergies between public and private ownership in other respect, this may actually be another valid reason why cross equity deals are becoming increasingly more popular in airport privatisation (O'Connor 2002, May).

Capital structure is the mix or proportion of a company's permanent long-term financing represented by debt, preferred stock and common stock equity. So far, it has not been given much attention in airport privatisation and the listed companies in the airport sector have comparatively low levels of gearing as per the analysis of sample data. In view of the strong cash flows generated by steady growth in traffic volumes and the considerable fixed assets backing, airport companies would seem to be natural candidates for relatively high gearing (Deutsche Bank 2000; MSDW 2000).

The extent of debt financing has two important implications for the rate of return realized by stockholders. Firstly, the interest is tax deductible and secondly, the borrowing rate usually differs from the rate earned from the investment in productive assets (Weston et al, 1996).

The simplified example calculation in Table 6.11 below illustrates the principle effect of financial leverage on ROE.

Table 6.11: Example Calculation Financial Leverage

| **ROE = ROA x Financial Leverage** | | | |
|---|---|---|---|
| **High Gearing Level** | | **Low Gearing Level** | |
| • Total Assets | 3,000,000 | • Total Assets | 3,000,000 |
| • Shareholders' Funds | 1,000,000 | • Shareholders' Funds | 2,000,000 |
| • Financial Leverage | 300% | • Financial Leverage | 150% |
| • Return on Assets (ROA) | 5% | • Return on Assets (ROA) | 5% |
| • Return on Equity (ROE) | 15% | • Return on Equity (ROE) | 7.5% |

Generally, whenever ROA exceeds the cost of debt, leverage is favourable since it is lowering the weighted average cost of capital (WACC), representing the opportunity

cost of the financial assets employed. Creditors, however, will definitely look to equity, to provide a safety margin. The higher the leverage, as capital shifts from equity towards debt, the more they impose restrictions on the borrower, i.e. working capital uses, capital expenditures for fixed assets and equity revolvements. Debt, on the other hand, is a lever that can magnify both profits and losses. And in a more volatile environment as in the aftermath of the terrorist attacks of September 11, 2001, it may increase the potential for financial distress and failure (Black, Wright & Bachman 1998; Rappaport 1998; Weston et al 1996).

The already high gearing level of publicly owned airports, which can hardly be increased any further, may – in turn – also be one of the main reasons for airport privatisations. Under the Maastricht criteria of the European Stability Pact, governments cannot afford to put in additional funds in terms of equity, in order to finance necessary capital investment to cope with medium to long-term traffic growth. Contrariwise, privatisation proceeds are well received to alleviate budget deficits.

A change in ownership, however, is very likely to affect the credit rating and thus to restrict the feasible capital structure. The credit quality of the controlling shareholders will be of high importance for the rating on an airport. Therefore, the operating entity in a transaction is frequently ring-fenced from a weak controlling shareholder. Alternatively, support from government ownership will enhance an airport's credit standing. The analysis of the owners' creditworthiness in relation to the airport in question and their ability to back up the airport's credit strength is a standard procedure (S&P 2002, 2003).

With regard to the two hypotheses stated at the outset it was shown that partially and fully privatised airports operate in a more efficient manner, despite the higher revenue-generating abilities of publicly owned (and also partially privatised) ones. Due to the 'disadvantages' of fully privatised airports in terms of financing their capital, they do not appear to be highly attractive from an investor's perspective as clearly opposed to their

'hybrid' relatives. As compared to alternative capital investments, airports in general appear to generate lower return rates on equity, in line with their comparatively conservative risk profile. This will be investigated in detail in the next chapter, including an excursus on the analysis of the share price performance and valuation comparisons of the listed sample airport companies.

# CHAPTER 7

# CONSEQUENCES FOR MANAGING THE VALUE OF AIRPORTS

After primarily working out distinct characteristics of publicly owned versus privatised sample airports, their attractiveness as an investment shall now be elaborated on and compared to alternative capital projects. Moreover, the principles of airport economics and key value drivers will be described. This, of course, applies to all airport businesses, regardless of the respective ownership status. Nevertheless, performance profiles will summarize the main characteristics of sample airports grouped per degree of privatisation.

## 7.1 Return Rates in the Aviation Industry

As explained in Chapter 6, the reason for primarily focusing on ROE is the elegantly simple dynamics of this ratio, which shows the amount of earnings produced by each unit of equity. From the investor's point of view, an airport is obviously an attractive investment when it delivers above market or at least adequate rates of return. Table 7.1 shows a comparison of several return rates in the airport sector to the standard of related industries and alternative capital investments for the five years 1995 to 1999.

Table 7.1: ROE in the Airport Sector and the Aviation Industry

| **Airport Groupings / Alternative Investments** | **ROE** | | | | | **ROA** | | |
|---|---|---|---|---|---|---|---|---|
| | **1999** | **1998** | **1997** | **1996** | **1995** | **1999** | **1998** | **1997** |
| Total Sample | 8.6% | 10.7% | 10.8% | 10.9% | 9.5% | 5.2% | 5.8% | 4.6% |
| Publicly Owned | 3.1% | 5.8% | 9.2% | 10.1% | 13.0% | 3.7% | 4.3% | 3.4% |
| Privatised | 12.8% | 14.4% | 12.3% | 11.9% | 4.9% | 6.4% | 7.0% | 5.9% |
| Partially Privatised | 15.8% | 19.8% | 20.1% | 19.4% | 13.6% | 6.5% | 7.9% | 7.4% |
| Fully Privatised | 10.6% | 10.6% | 8.8% | 9.8% | 2.5% | 6.4% | 6.3% | 5.2% |
| The 500 Airlines | 17.0% | 20.0% | 16.0% | 14.0% | 11.0% | 6.0% | 6.0% | 6.0% |
| The 500 Aerospace | 16.0% | 18.0% | 21.0% | 18.0% | 13.0% | 6.0% | 5.0% | 6.0% |
| The 500 Median | 15.2% | 13.4% | 13.9% | 14.1% | 14.0% | 4.6% | 3.4% | 3.9% |
| The 500 Median Total Return to Investors [1] | - 5.6% | 7.9% | 30.5% | 20.9% | 32.8% | [1]incl. price appreciation and dividend yield | | |
| UK Stockmarket Perf. [2] | 17.8% | 14.5% | 24.7% | 11.6% | 20.3% | [2]FTSE 100 change per year | | |
| US Stockmarket Perf. [3] | 19.5% | 26.7% | 31.0% | 20.3% | 34.1% | [3]S&P 500, change per year | | |
| UK Government Bonds [4] | - 0.9% | 19.8% | 14.1% | 7.3% | 16.4% | [4]nominal | | |
| US Government Bonds [5] | -2.9% | 10.3% | 10.0% | 2.9% | 17.4% | [5]nominal | | |

Table 7.1: ROE in the Airport Sector and the Aviation Industry (cont'd)

| Airport Groupings / Alternative Investm. | ROS | | | ROCE | | | Operating Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1997 | 1999 | 1998 | 1997 | 1999 | 1998 | 1997 |
| Total Sample | 13.5% | 13.5% | 11.5% | 9.2% | 9.8% | 8.7% | 22.9% | 23.4% | 21.4% |
| Publicly Owned | 7.0% | 6.7% | 7.0% | 8.8% | 8.9% | 7.1% | 17.1% | 16.8% | 15.0% |
| Privatised | 18.8% | 19.1% | 16.3% | 9.5% | 10.7% | 10.5% | 27.8% | 28.9% | 28.1% |
| Partially Privatised | 13.3% | 13.9% | 13.6% | 10.8% | 12.7% | 13.1% | 22.7% | 23.0% | 22.9% |
| Fully Privatised | 22.7% | 22.7% | 17.5% | 8.6% | 9.2% | 9.4% | 31.3% | 33.0% | 30.5% |
| The 500 Airlines | 5.0% | 6.0% | 5.0% | -- | -- | -- | -- | -- | -- |
| The 500 Aerospace | 6.0% | 6.0% | 5.0% | -- | -- | -- | -- | -- | -- |
| Aerospace 100 Global | -- | -- | -- | 16.3% | 16.2% | -- | 8.9% | 8.5% | 7.0% |
| Aerospace 100 Europe | -- | -- | -- | 20.3% | 23.0% | -- | 8.2% | 7.5% | 6.0% |

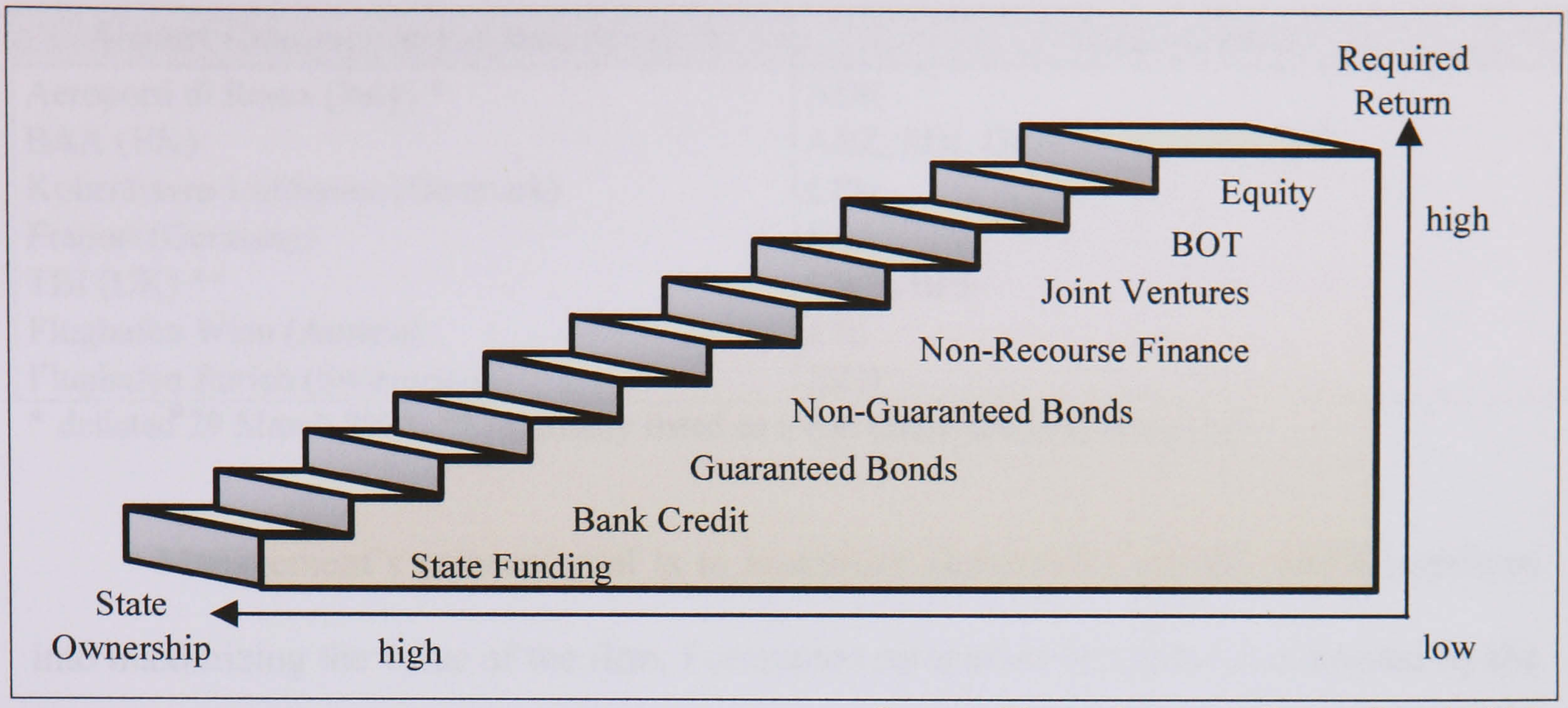
Source: Own calculation; Fortune Magazine; Flight International.; The Economist Pocket Investor

Although not fully comparable because of the effects of dividends and capital gains, this comparison discloses again that the return on equity – as well as the underlying ROA, ROS, ROCE and operating margin – differs considerably between the sample airports grouped per ownership characteristics and/or alternative capital investments. From the investor's perspective this confirms that only partially privatised airports may be considered an attractive alternative – also for the comparatively stable return rates.

Equities represent the risk capital that is invested in projects to produce the best returns and can be reinvested elsewhere as soon as more profitable opportunities arise. And demand will always draw finite risk capital to where the returns are likely to be acceptable. The benchmark, as set by competitive capital markets, is anything better than that offered by low-risk investments, such as government bonds (Damodaran 1996; Ryland 2000).

Figure 7.1 illustrates that any change in the ownership structure of a firm and likewise airport towards privatisation demands a parallel increase of returns on capital employed. A successful evolution or transfer of airports to private ownership is essential, if the capital investment needs in infrastructure and facilities are to be met. But stimulating the private sector requires a focus on profits and the demonstration of favourable returns in comparison to alternative investments. In this respect, the return rates on equity of the sample airports – other than the partially privatised ones – are not really encouraging.

Figure 7.1: Ownership Structure and Required Return Rates




Source: Illustration according to Freud 1995

## 7.2 Excursus: Relative Share Price Performance of Quoted Airport Companies and Valuation Comparisons

Every time an airport sounds mildly interested in privatising, financial institutions, construction and consulting companies and other interested airports themselves line up to investigate. This interest is easy to understand. Revenue from fees and concessions are rather steady, stable and almost risk-free. Airports are large businesses, providing a complete range of essential services to a broad customer base. They represent a growth business which is relatively recession-proof and commands premiums. They are essentially monopoly suppliers with little real competition in the local marketplace and high entry barriers. They are high-utilization assets, in use 365 days a year and airport customers can be viewed as captive. These facts make airports structurally attractive as investments because the expected earnings are likely to be favourable and above market average (Salomon Brothers 1996; SBC Warburg 1996a, 1996b, 1997b).

The airport sector is still small and at the end of 2002 only six companies owning equity stakes in one or more of the sample airports were listed at a local stock exchange. Table 7.2 enumerates the respective entities and associated airports included in this study.

Table 7.2: Quoted Sample Airport Companies

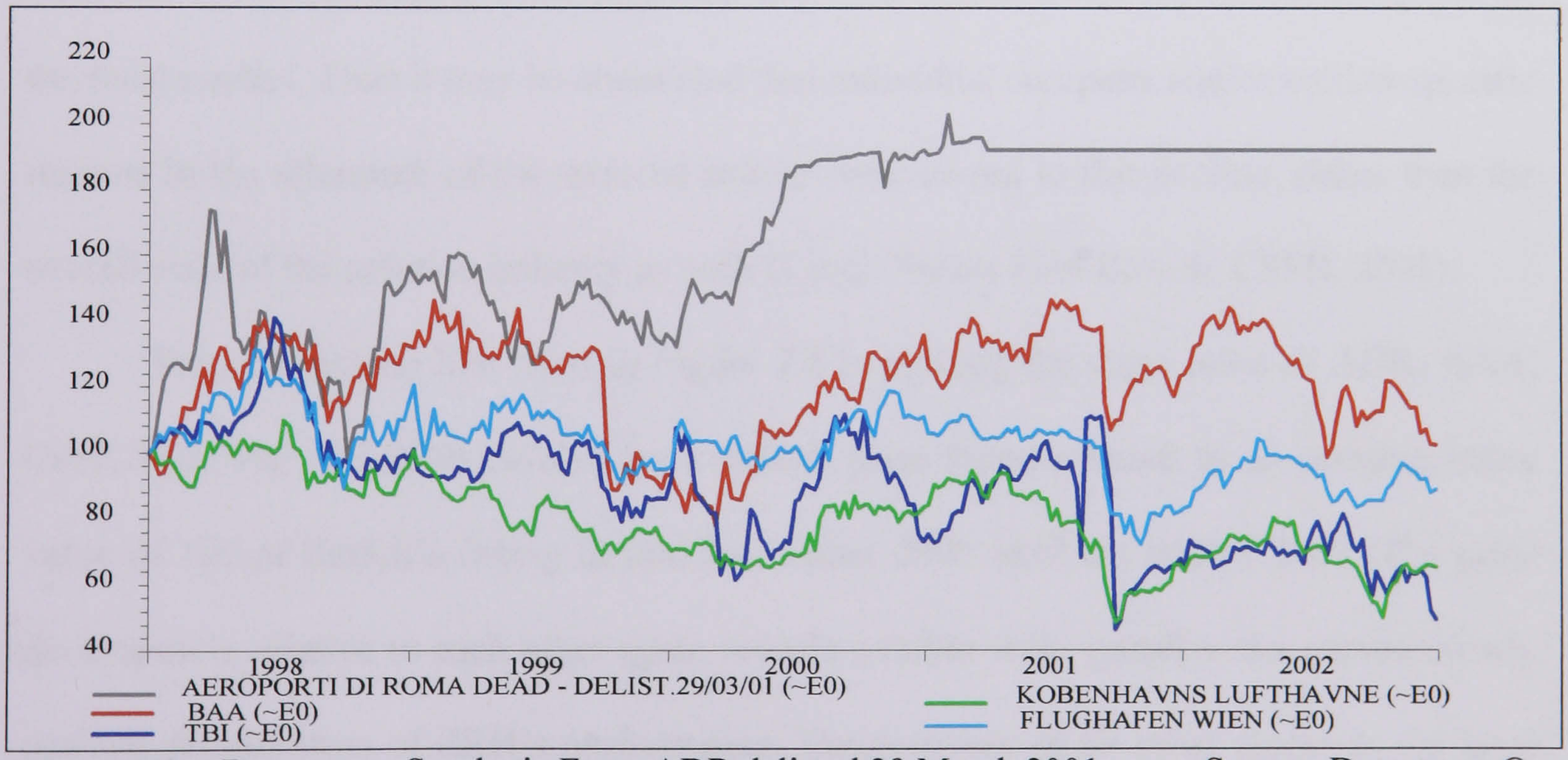
| Airport Company as per Datastream® | Sample Airports |
|---|---|
| Aeroporti di Roma (Italy) * | ADR |
| BAA (UK) | ABZ, EDI. GLA. LGW, LHR, STN |
| Kobenhavns Lufthavne (Denmark) | CPH |
| Fraport (Germany) | FRA |
| TBI (UK) ** | CWL, BFS |
| Flughafen Wien (Austria) | VIE |
| Flughafen Zurich (Switzerland) | ZRH |

* delisted 29 March 2001; ** originally listed as a real estate property company

Management's primary goal is to maximize shareholder wealth, which translates into maximizing the value of the firm. For quoted companies this value is measured by the price of the respective common stock. The stock market evaluates every facet of a business in a nutshell, expressed by the investors' appreciation of the respective shares.

As illustrated by the Datastream® charts below, the share price development of quoted sample airport companies reveals common as well as individual characteristics.

Figure 7.2: Comparison Line Chart of Listed Sample Airport Companies Rebased to 1998




Note: ~E0 = Datastream Synthetic Euro; ADR delisted 29 March 2001 Source: Datastream®

The comparison line chart (Figure 7.2) is plotting the share price of ADR (delisted end March 2001), BAA, CPH, TBI and VIE divided by a default price index rebased to an opening index value of 100 at the beginning of 1998, when TBI's transformation process

from a property company to an airport operator started. The development of the respective equities reveals a rather wide spread. The feature which all stocks have in common is the sharp drop after the terrorist attacks on September 11, 2001. Table 7.3 summarizes the effects of September 11 in a comparison before and after the assault.

Table 7.3: Share Prices Before and After the Events of September 11, 2001

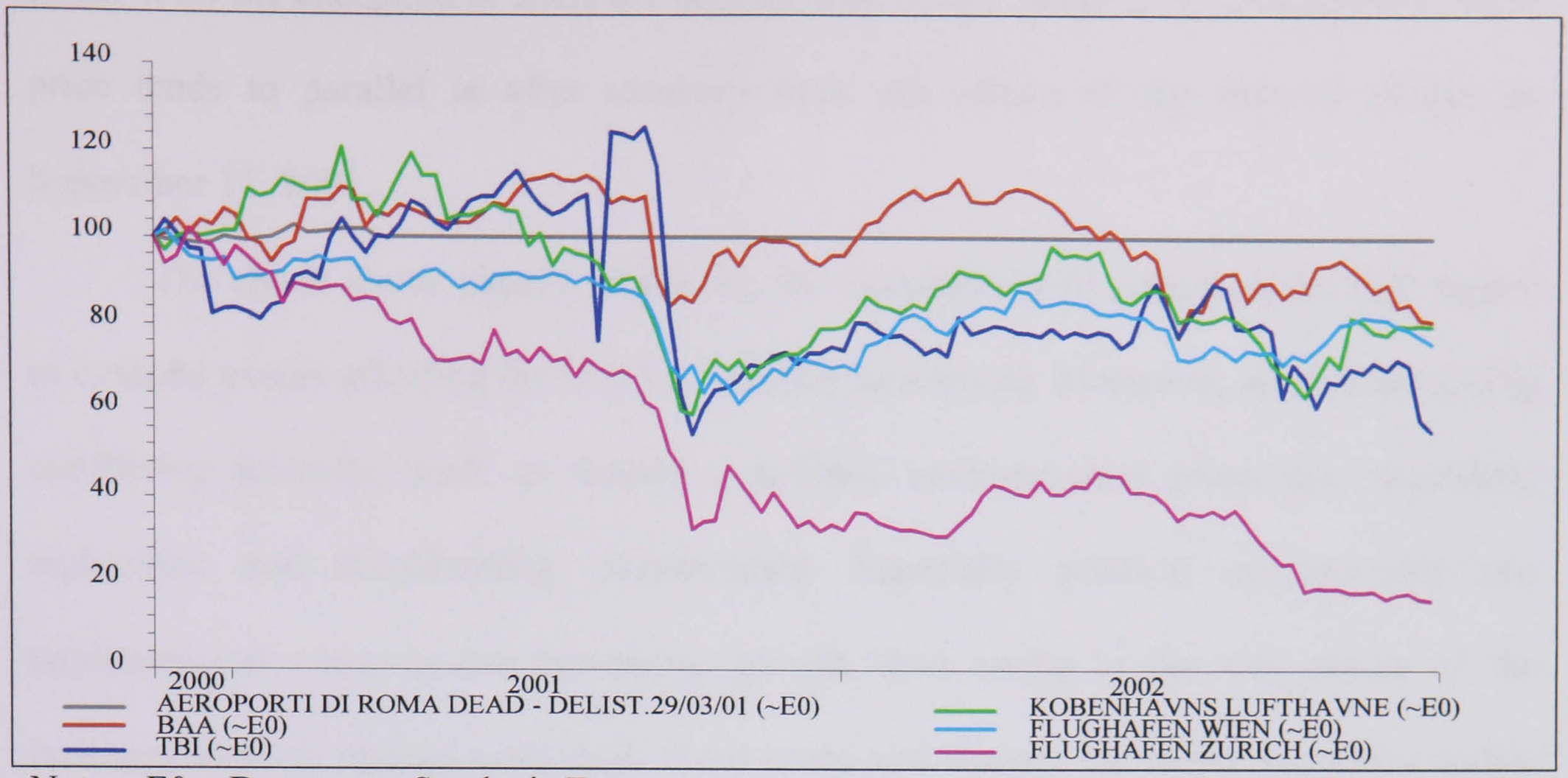
| Airport Group / Company | Currency | Share Price | | | Base Airline % Change | Perform. vs. Base Airline | Perform. vs. Market |
|---|---|---|---|---|---|---|---|
| | | 12 Feb 02 | 10 Sep 01 | % Change | | | |
| BAA | UK pence | 640 | 618 | 3.6% | -24.2% | 36.7% | 0.4% |
| CPH | DKK | 567 | 561 | 1.1% | -0.6% | 1.8% | 4.0% |
| FRA | EUR | 29.00 | 30.80 | -5.8% | 10.5% | -14.8% | -10.4% |
| TBI | UK pence | 58.25 | 96.00 | -39.3% | n/a | n/a | -41.0% |
| VIE | EUR | 34.67 | 35.97 | -3.6% | -12.1% | 9.7% | -4.0% |
| ZRH | CHF | 89.25 | 158.00 | -43.5% | -100.0% | n/a | -44.5% |

Source: Schroder Salomon Smith Barney, SSSB, 2002

The table on share prices before and after the events of September 11, 2001, shows that except for TBI and ZRH airport stocks regained the former price level within five months. TBI's and ZRH's share price performance also deteriorated considerably versus the local market. Thus it may be concluded that individual company and/or market-specific reasons in the aftermath of the terrorist attacks were causal to this decline, rather than the overall state of the aviation industry as such (Credit Suisse First Boston, CSFB, 2001).

The comparison line chart in Figure 7.3 is plotting the share price of ADR, BAA, CPH, TBI, VIE and ZRH divided by a default price index rebased to an opening index value of 100 at Zurich's listing in mid November 2000 until the end of 2002. The price development relative to each other again reveals a rather wide spread and a comparatively marked deterioration of ZRH's performance. The recovery of all other stocks to the level before September 11, 2001, is clearly visible. Due to their pricing structure and diversified customer base airports are less exposed to traffic decline than airlines and stocks show more resilience than equity market indices in general (Jane's Airport Review 2003).

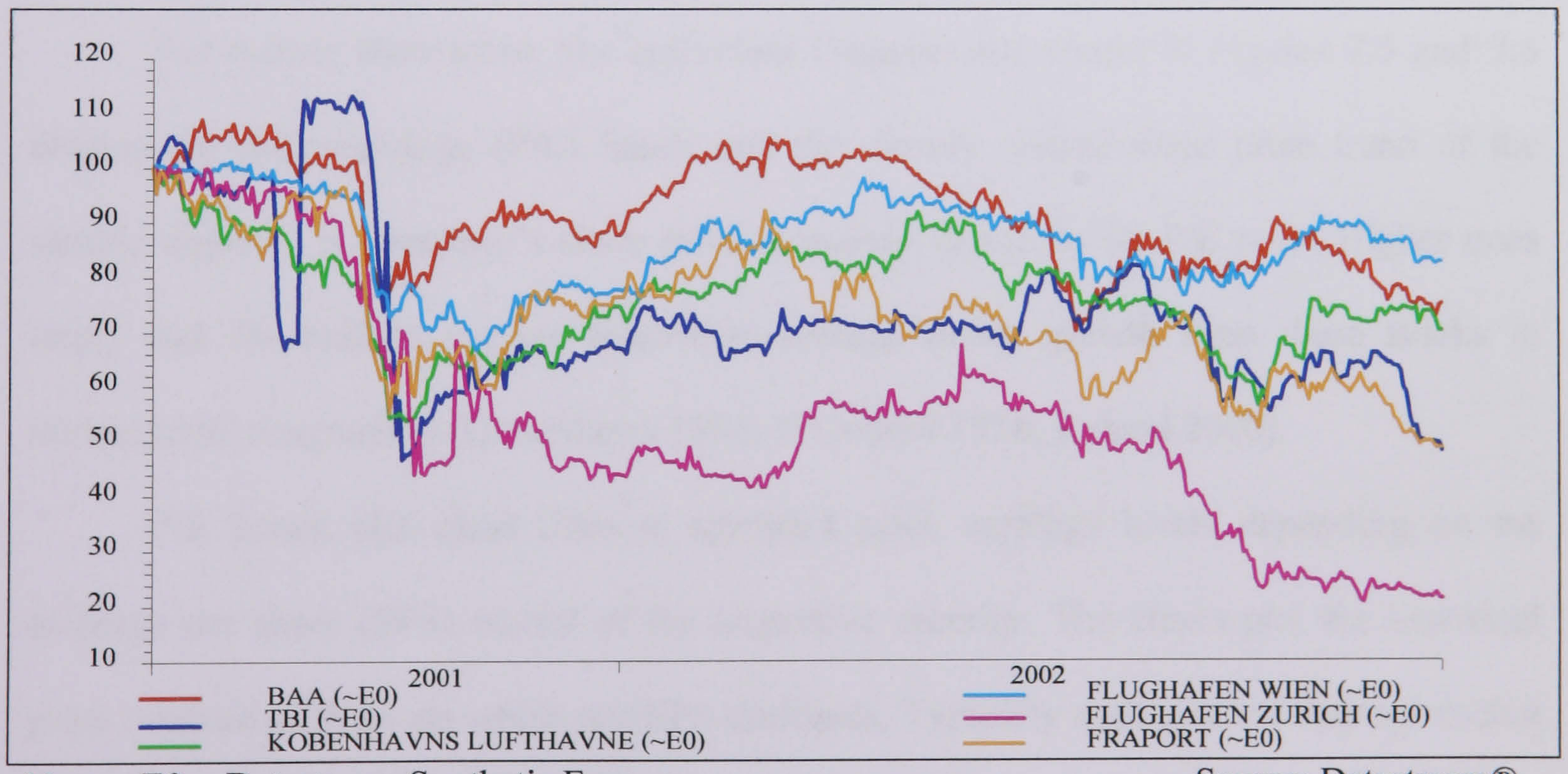
Figure 7.3: Comparison Line Chart of Listed Sample Airport Companies Rebased to Flughafen Zurich's Listing and Public Placement, November 2000




Note: ~E0 = Datastream Synthetic Euro Source: Datastream®

The latest addition of sample airport companies to the still young sector was Fraport's initial public offering (IPO) on 11 June, 2001.

Figure 7.4: Comparison Line Chart of Listed Sample Airport Companies Rebased to Fraport's Initial Public Offering, June 2001




Note: ~E0 = Datastream Synthetic Euro Source: Datastream®

The comparison line chart of Figure 7.4 is plotting the share price of BAA, CPH, TBI, VIE, ZRH and FRA divided by a default price index rebased to an opening index

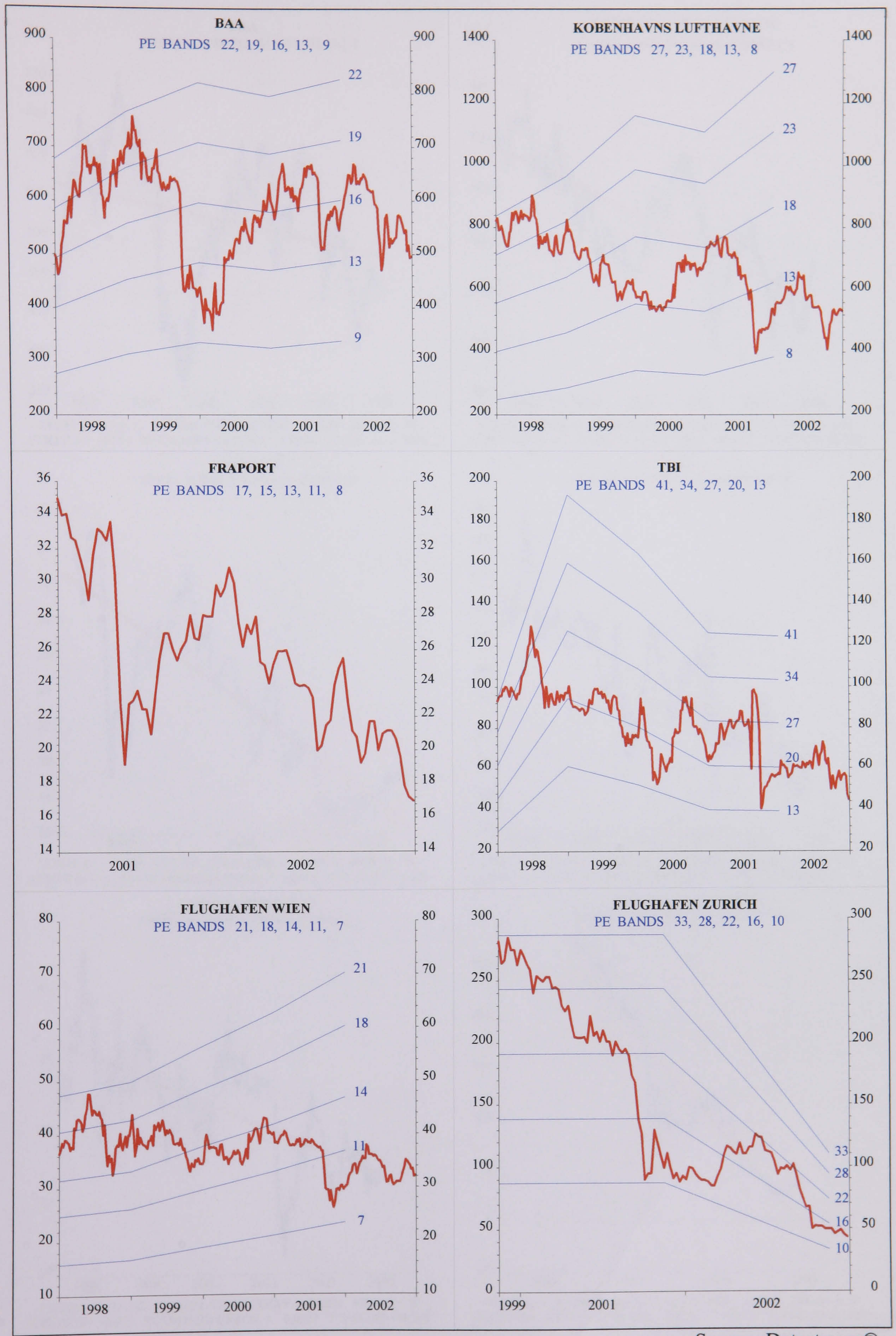
value of 100 at Fraport's initial public offering in the middle of June 2001 until the end of 2002. With the exception of ZRH the performance of the sample airport companies' share price tends to parallel in after recovery from the effects of the terrorist attacks on September 11, 2001.

The charts above clearly emphasise the vulnerability of airport stocks with regard to external events affecting the aviation industry as a whole. Moreover, airports are facing conflicting interests, such as business, politics, environmental protection, regulatory authorities and neighbouring communities. Especially political controversies and environmental concerns are hampering growth. And owing to the very nature of the business airports operate with high fixed costs and limited flexibility regarding traffic declines which also have a direct impact on the majority of revenue sources. On the other hand, airports have sound balance sheets and assets consist almost entirely of long-term tangible fixed assets. Despite recent developments (September 11, Iraq war, SARS) traffic growth is likely to outpace GDP growth. And locally speaking, airports are quasi-monopolies and entry barriers for competitors are high (HypoVereinsbank 2002).

For further illustration, the individual Datastream® charts in Figures 7.5 and 7.6 display the price/earnings (P/E) bands and the closely related share price trend of the sample airports. A company's share price is mainly driven by its P/E ratio. Higher ones imply that the market expects faster-than-average future growth from these stocks in intrasectoral comparison (Damodaran 1996; O'Connor 1996; Ryland 2000).

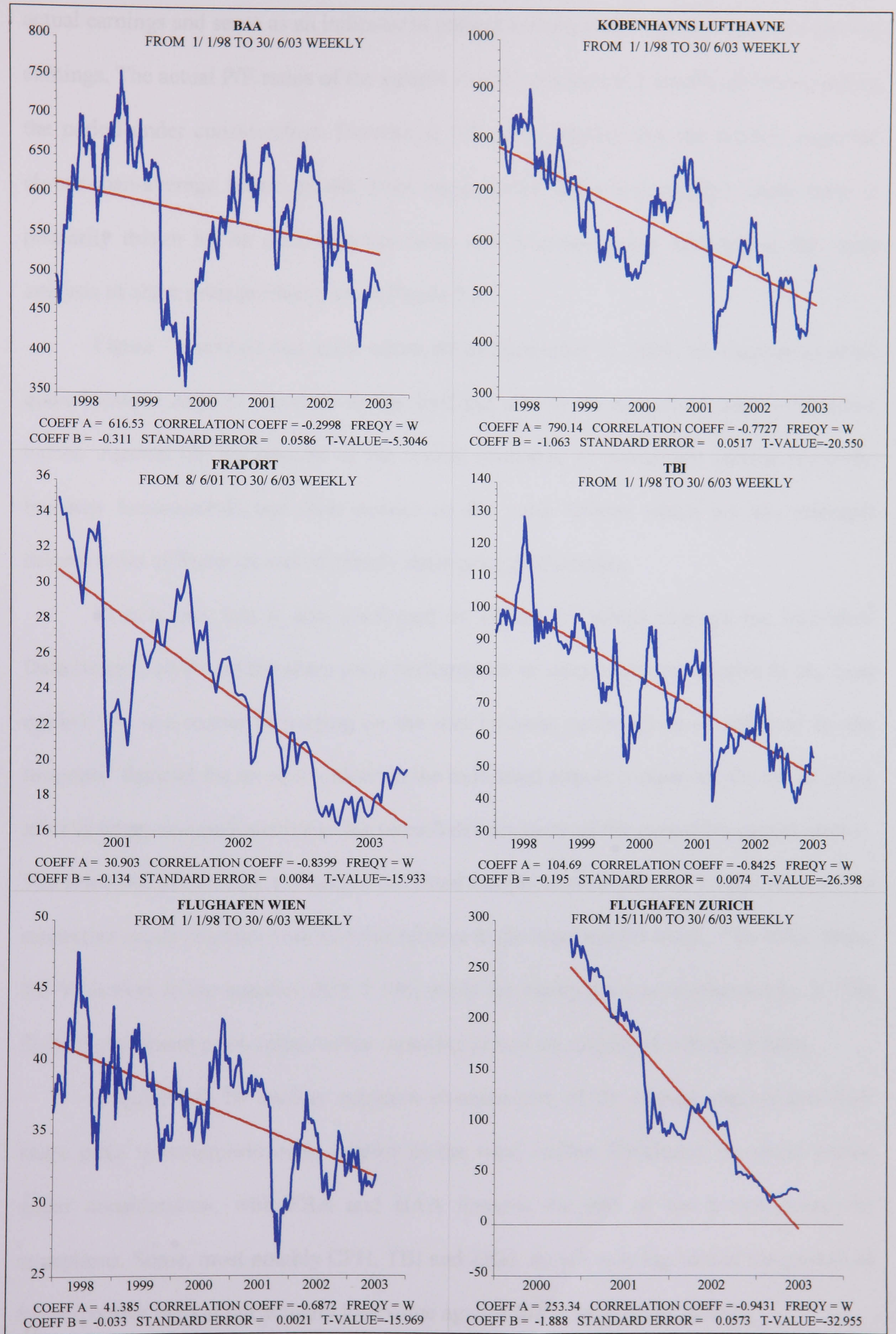
P/E bands plot chart lines at specified price earnings levels depending on the earnings per share (EPS) record of the respective security. The charts plot the historical price overlaid with bands which are EPS multiples. Typically multiples are entered so that the top band passes through the high and the bottom band passes through the low price. The BAA, for example, traded between 600p-800p, slid in 1999/2000 and were up again in a range of 400p-600p per share, corresponding to P/E multiples of roughly 20, 15 and 10.

Figure 7.5: Price / Earnings Bands of Quoted Sample Airports




Source: Datastream®

Figure 7.6: Trend Analysis of Sample Airports' Share Price Performance




Source: Datastream®

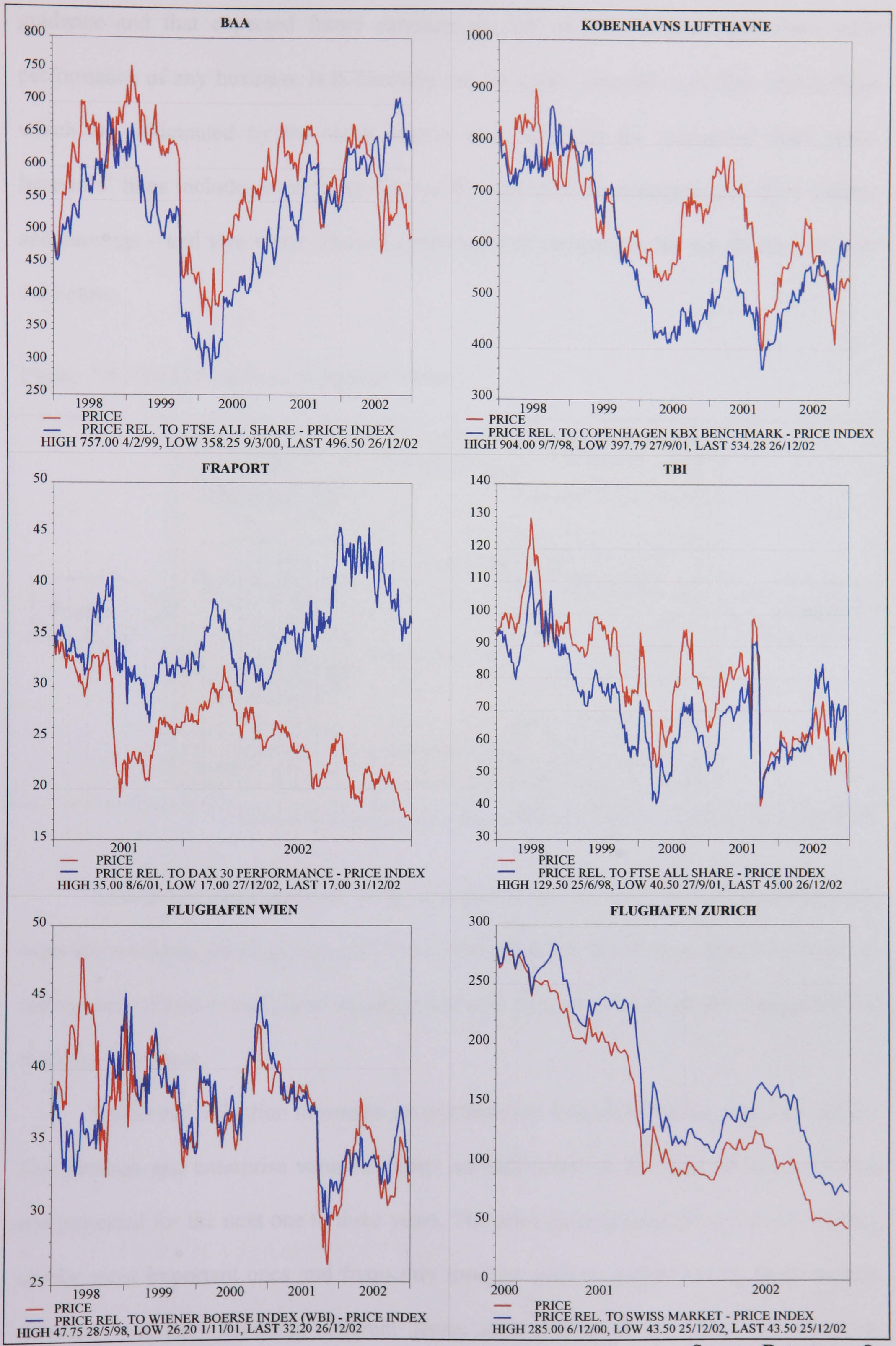
The P/E bands in Figure 7.5 measure the progress of the stock in relation to its actual earnings and serve as an indicator to project the future share price based on expected earnings. The actual P/E ratios of the sample airports are almost generally declining during the period under consideration. Decreasing P/E ratios implied that the markets expected slower-than-average future growth from these stocks. Since a company's share price is primarily driven by its price/earnings ratio, this is consequently reflected in the trend analysis of share price performance in Figure 7.6.

Figure 7.6 reveals that in the aftermath of September 11, 2001, the share price of all quoted sample airports rebounds to the level but also to the downward trend established before. Against the background of the overall economic or investment climate it are the business fundamentals and their impact on the value drivers which are the principal determinants of financial and ultimately share price performance.

In principle, this is also confirmed by Figure 7.7 which displays the individual Datastream® charts on the share price performance of sample airports relative to the local market. As one means to judging on the real business performance as reflected by the investors' demand for an equity share in the individual airport companies, the actual stock price is being assessed relative to the overall development of the respective capital market. The price and price relative charts of the listed sample airports plot the market price of the respective equity together with its price relative to the local market index. This index forms the Y element in the equation X/Y * 100, while the equity price is represented by X. The highest and lowest price values of the reporting period are displayed with their dates.

It appears to be another common characteristic of the quoted airports that their share price is underperforming relative to the local market for almost the entire period under consideration, with FRA and BAA towards the end of the period being the exceptions. Some, most notably CPH, TBI and ZRH, do not only lag behind the growth of the respective market but actually lose value against to the local index as well.

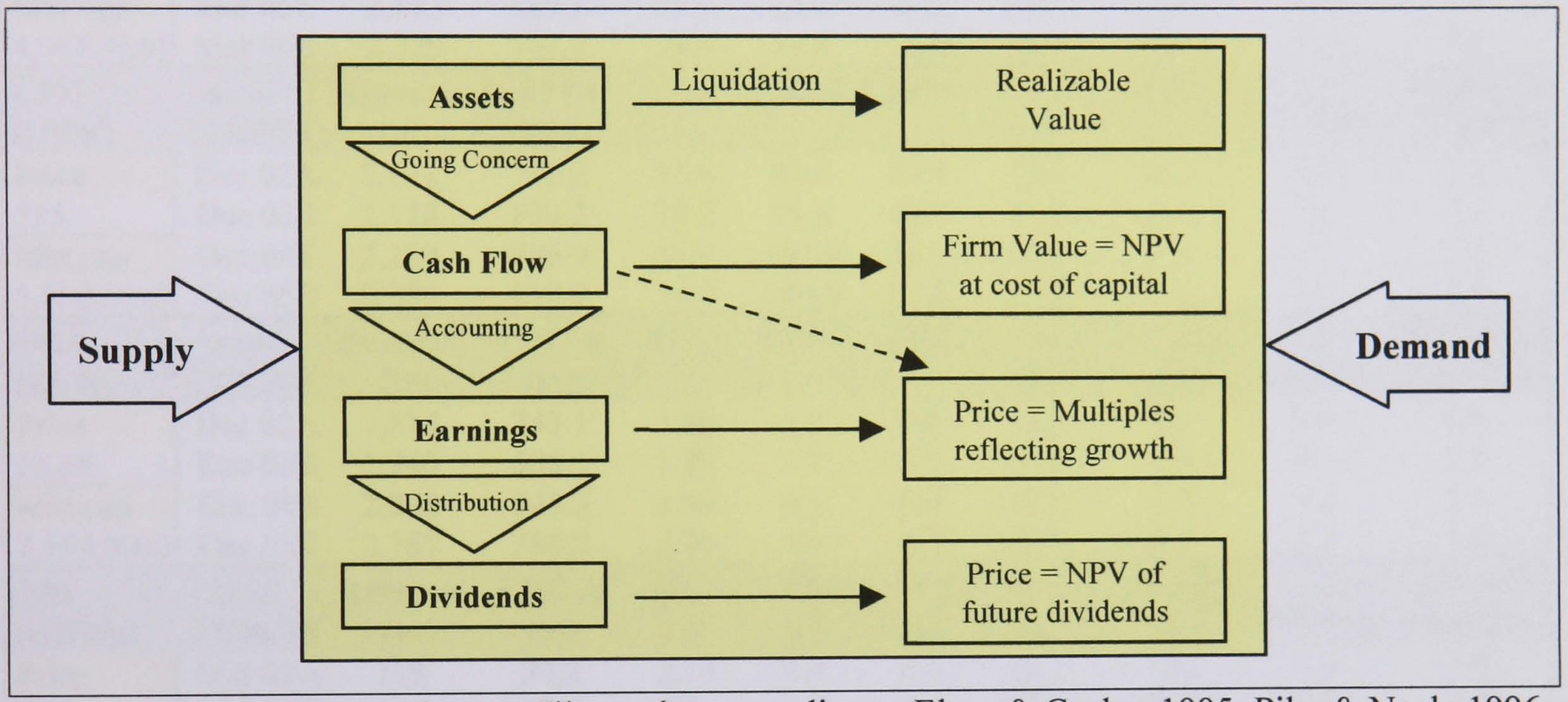
Figure 7.7: Relative Share Price Performance of Quoted Sample Airports




Source: Datastream®

It goes without saying that historical share performance can only give limited guidance and that expected future earnings are key to the valuation and share price performance of any business. It is basically the investors' perception of likes and dislikes which are anticipated by the stock market and determine the respective share price. Investors' likes includes everything bearing the potential for sustained growth in volume and earnings – and vice versa. The basic principles of company value are shown in Figure 7.8 below.

Figure 7.8: The Principles of Company Value




Source: Illustration according to Elton & Gruber 1995; Pike & Neale 1996

As with any other business entity an airport is valued on the basis of its current and expected revenues, earnings and cash flow. With regard to the stock market it is useful to differentiate between traditional single-period and alternative multi-period approaches to evaluate a business.

Traditional valuation measures are performance indicators for the very near future. The earnings and enterprise value multiples are calculated on the basis of historical data and projected for the next one to three years. The price/earnings and price/cash flow ratios are the most important ones and frequently used by analysts and investors. Despite their simplicity and easy handling, different depreciation policies in the sector may have an

impact on comparative earnings per share valuations. Therefore, cash valuations are the key comparatives for international airports and price/cash earnings per share (P/CEPS) multiples appear to be more appropriate for comparison (UBS 1996; Ryland 2000).

As an example, a number of different valuation measures are assembled in Table 7.4, in which EBITA stands for operating profit before amortization of goodwill.

Table 7.4: Traditional Valuation Measures of Quoted Airport Companies as of Mid 2003

| BAA (GBP/p) | as of 27/08/03 | Revenue (m) | EBITA (m) | EPS* (p) | CEPS (p) | DPS (p) | P/E (x) | P/CEPS (x) | EV/ EBITDA | Dividend Yield (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Price | Mar 03A | 1,909 | 588.0 | 32.8 | 58.5 | 19.0 | 14.3 | 8.0 | 8.2 | 4.0 |
| 470 | Mar 04E | 2,024 | 616.1 | 32.6 | 60.1 | 19.0 | 14.4 | 7.8 | 8.7 | 4.0 |
| Mkt cap | Mar 05E | 2,173 | 689.1 | 35.9 | 65.8 | 20.0 | 13.1 | 7.1 | 8.8 | 4.2 |
| 4,967.9(m) | Mar 06E | 2,329 | 763,2 | 39.4 | 71.6 | 20.9 | 11.9 | 6.6 | 8.8 | 4.5 |
| **CPH (DKK)** | **as of 27/08/03** | **Revenue (m)** | **EBITA (m)** | **EPS*** | **CEPS** | **DPS** | **P/E (x)** | **P/CEPS (x)** | **EV/ EBITDA** | **Dividend Yield (%)** |
| Price | Dec 02A | 2,121 | 713.2 | 35.6 | 87.6 | 13.4 | 15.6 | 6.3 | 7.7 | 2.4 |
| 555 | Dec 03E | 2,128 | 690.3 | 38.9 | 91.6 | 14.7 | 14.3 | 6.1 | 7.6 | 2.7 |
| Mkt cap | Dec 04E | 2,269 | 786.9 | 47.1 | 101.4 | 16.2 | 11.8 | 5.5 | 6.7 | 2.9 |
| 5,050.5(m) | Dec 05E | 2,386 | 858.9 | 54.2 | 109.6 | 17.8 | 10.2 | 5.1 | 6.1 | 3.2 |
| **FRA (EUR)** | **as of 27/08/03** | **Revenue (m)** | **EBITA (m)** | **EPS*** | **CEPS** | **DPS** | **P/E (x)** | **P/CEPS (x)** | **EV/ EBITDA** | **Dividend Yield (%)** |
| Price | Dec 02A | 1,874 | 343.1 | 1.80 | 4.5 | 0.0 | 12.7 | 5.2 | 3.9 | n/a |
| 23.35 | Dec 03E | 1,940 | 308.1 | 1.80 | 3.7 | 0.5 | 13.0 | 6.2 | 4.1 | 2.1 |
| Mkt cap | Dec 04E | 2,048 | 345.3 | 2.00 | 4.1 | 0.6 | 11.5 | 5.7 | 3.8 | 2.6 |
| 2,104.0(m) | Dec 05E | 2,167 | 388.2 | 2.20 | 4.4 | 0.7 | 10.5 | 5.3 | 3.5 | 3.0 |
| **TBI (GBP/p)** | **as of 27/08/03** | **Revenue (m)** | **EBITA (m)** | **EPS* (p)** | **CEPS (p)** | **DPS (p)** | **P/E (x)** | **P/CEPS (x)** | **EV/ EBITDA** | **Dividend Yield (%)** |
| Price | Mar 03A | 178 | 34.2 | 3.18 | 4.9 | 2.3 | 18.7 | 12.1 | 7.0 | 3.9 |
| 59.5 | Mar 04E | 192 | 38.0 | 3.31 | 5.5 | 2.3 | 18.0 | 10.7 | 6.5 | 3.9 |
| Mkt cap | Mar 05E | 209 | 42.9 | 3.89 | 6.4 | 2.5 | 15.3 | 9.3 | 5.8 | 4.2 |
| 332.5(m) | Mar 06E | 222 | 47.5 | 4.53 | 7.1 | 2.7 | 13.1 | 8.3 | 5.3 | 4.5 |
| **VIE (EUR)** | **as of 27/08/03** | **Revenue (m)** | **EBITA (m)** | **EPS*** | **CEPS** | **DPS** | **P/E (x)** | **P/CEPS (x)** | **EV/ EBITDA** | **Dividend Yield (%)** |
| Price | Dec 02A | 328 | 77.2 | 2.48 | 4.5 | 2.0 | 13.3 | 13.3 | 4.6 | 6.1 |
| 33.0 | Dec 03E | 354 | 83.5 | 2.82 | 5.1 | 2.0 | 11.7 | 11.7 | 4.7 | 6.1 |
| Mkt cap | Dec 04E | 371 | 85.9 | 2.74 | 5.4 | 2.0 | 12.0 | 12.0 | 5.3 | 6.1 |
| 692.7(m) | Dec 05E | 388 | 88.6 | 2.73 | 5.9 | 2.0 | 12.1 | 12.1 | 5.5 | 6.1 |
| **ZRH (CHF)** | **as of 27/08/03** | **Revenue (m)** | **EBITA (m)** | **EPS*** | **CEPS** | **DPS** | **P/E (x)** | **P/CEPS (x)** | **EV/ EBITDA** | **Dividend Yield (%)** |
| Price | Dec 02A | 528 | 69.1 | 1.68 | 29.8 | 0.0 | 22.8 | 22.8 | 9.8 | n/a |
| 38.2 | Dec 03E | 545 | 70.0 | (1.18) | 31.2 | 1.0 | (32.3) | (32.3) | 10.3 | 2.6 |
| Mkt cap | Dec 04E | 583 | 76.3 | 0.21 | 37.4 | 1.1 | 181.7 | 181.7 | 9.1 | 2.9 |
| 187.6(m) | Dec 05E | 611 | 91.9 | 2.10 | 40.1 | 1.2 | 18.2 | 18.2 | 8.3 | 3.1 |

* EPS pre amortization

Source of data: DrKW 2003

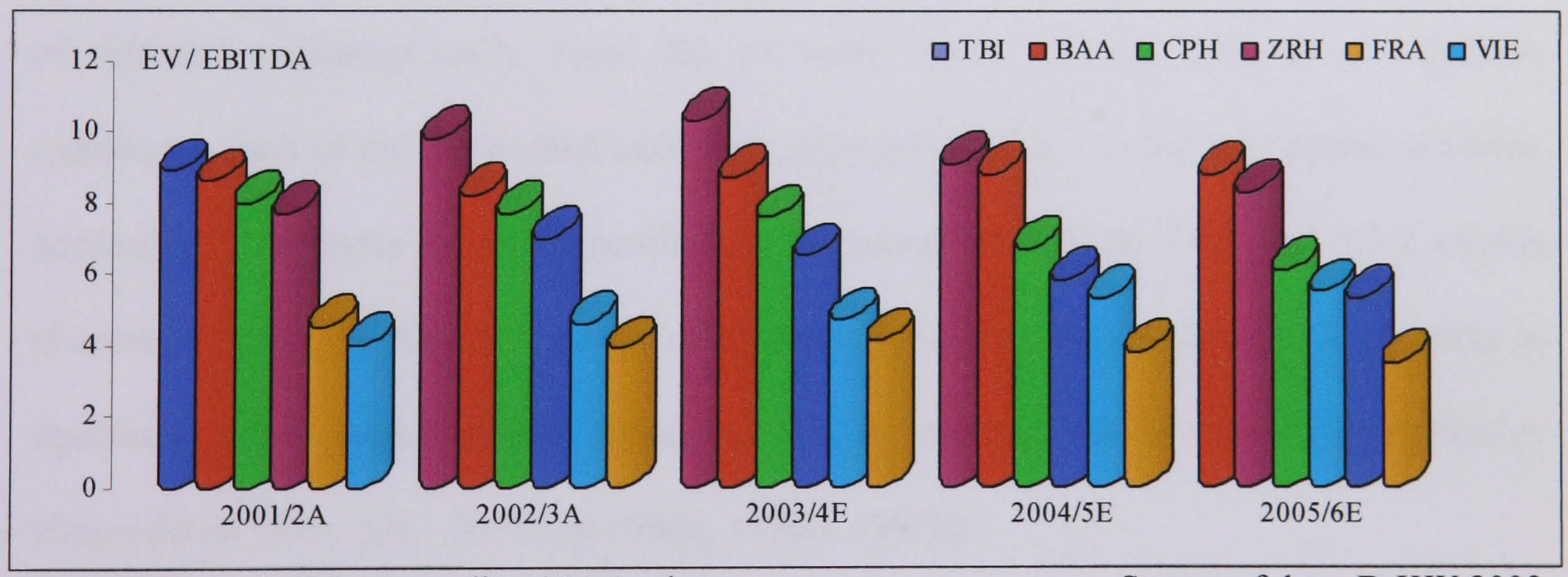
The initial problem is that currently there still are only a small number of airports for drawing comparisons, exacerbated by the lack of uniformity provided by traditional valuation measures. There may also exist differences in the actual level of these ratios due

to the differences inherent in the individual airport companies. A major methodological weakness of these static snapshot valuation measures is that they are based on constant share prices and market capitalization. This does not reflect the dynamics of the business and results in rather 'stable' multiples (UBS 1996).

Still, the enterprise value multiple EV/EBITDA, defined as the ratio of market capitalization plus net debt versus earnings before depreciation, interest and taxes, seems to provide one useful basis for comparative valuation of the sector. The reason for this is that it fluctuates far less over the investment cycle – which will be elaborated on next – than other traditional earnings measures (SBC Warburg 1996b).

The downside of less fluctuation, however, is the concealment of the considerable depreciation effects on accounted earnings. Figure 7.9 illustrates that there exist significant differences in the actual level of the EV/EBITDA enterprise value multiple due to the differences between the individual airport companies and based on the expected future earnings and anticipated near-term likes and dislikes (Morgan Stanley 2003).

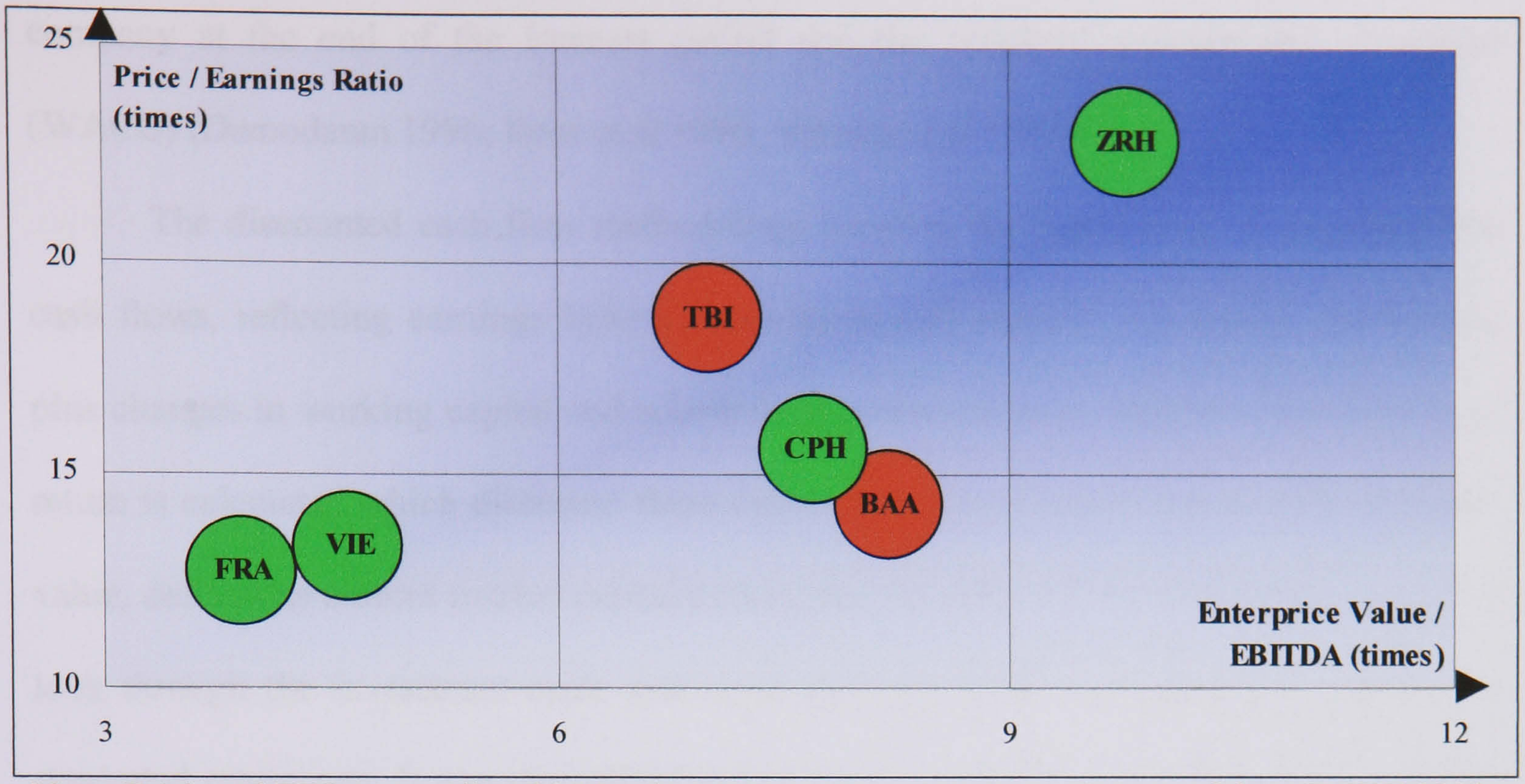
Figure 7.9: Enterprise Value Multiples: EV / EBITDA Comparisons as of Mid 2003




Note: BAA and TBI year ending 31 March Source of data: DrKW 2003

Each of the key value drivers as the major determinants of the underlying airport economics can lead to considerable variations in the valuation of a firm – whether it be a traditional P/E ratio or an EV/EBITDA multiple. Figure 7.10 exemplifies the positioning of the listed sample airports in a matrix incorporating both measures.

Figure 7.10: Price / Earnings Ratio and Enterprise Value / EBITDA (End of FY 2002-03)




Note: BAA and TBI year ending 31 March Source of data: DrKW 2003

As per the end of FY 2002-03 the market looked upon ZRH more favourably than on its peers TBI, CPH and BAA, while VIE and FRA were valued comparatively cheap.

The traditional methods of valuation introduced above undoubtedly serve a useful function. In particular, the use of EBITDA appears to exhibit some correlation in valuation between the quoted airport companies. But investors will wish, no doubt, to use a number of different valuation tools. From the investors' point of view, alternative valuation techniques such as the discounted cash flow approach (DCF) – or the calculation of owner earnings and analysis of return profiles as discussed in sections 7.4.3 and 7.5.2 of this chapter – provide a superior means of establishing a long-term valuation in addition to traditional stock market-related measures. Yet, no method can be considered definitive (Damodaran 1996; SBC Warburg 1996a, 1996b, 1997b).

One alternative valuation technique is the discounted cash flow approach. Rather than looking at the short-term snapshots of P/E ratios or EV to EBITDA, it is aiming at the medium- to long-term valuation of a business, providing interesting insight for investors. Generally, the DCF-method determines the enterprise value of a firm by discounting the stream of cash flows at the weighted average opportunity cost of capital of the firm. Key

components of this concept are the estimated free cash flows, the terminal value of the company at the end of the forecast period and the weighted average cost of capital (WACC) (Damodaran 1996; Ross et al 1996; Weston et al 1996).

The discounted cash flow methodology involves the forecasting of operating free cash flows, reflecting earnings before depreciation and interest, less capital expenditure plus changes in working capital and adjusted for corporation tax. Then the internal rate of return is calculated which discounts these future cash flows back to the present enterprise value, defined as current market capitalization plus net debt. This procedure allows one to look through the investment cycle and constitutes a long-term model which reveals the generated return rate. It provides useful insight into a longer-term valuation framework by looking through the investment cycle (Damodaran 1996; SBC Warburg 1996a, 1997b).

Although rather straight forward in conceptual terms, establishing integrated DCF-models is a complex exercise which is clearly beyond the scope of this study. Examples of listed sample airports are included in topical brokers' research. In accordance with the focus of this research, the underlying airport business model, its economics and the crucial impact of the investment cycle – all so fundamental to the business and essential for any valuation attempt – will be analysed instead.

## 7.3 The Airport Business Model

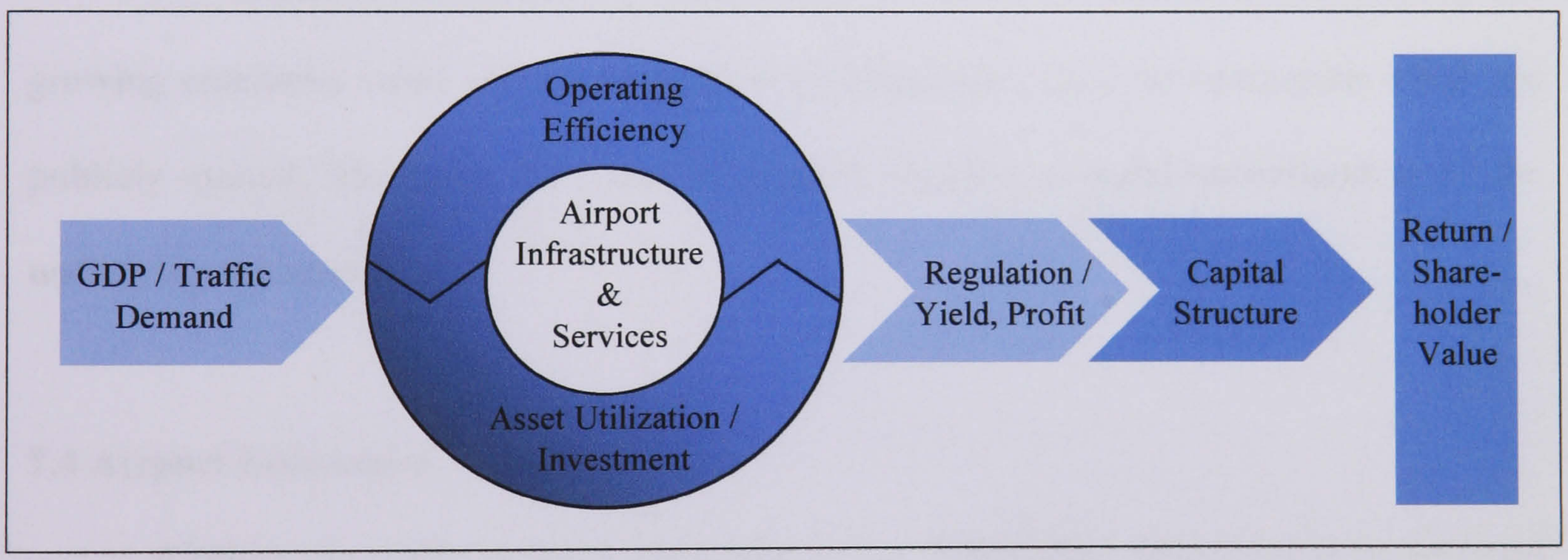
A business model is essentially the method of doing business by which a company can sustain itself – that is, generate revenue. The business model details how it makes money by specifying where it is positioned in the value chain. Each business is characterized by a unique set of processes for creating value for customers (Kaplan & Norton 1996).

As stated earlier, Doganis and others maintain that airports basically are one or more runways and complementary facilities for aircraft, such as taxiways, apron area,

aircraft stands etc. and associated terminals and facilities for passenger and freight handling. Their typical role is to provide and maintain all necessary infrastructure as well as essential services. These core activities regularly include passenger search and perimeter security, fire fighting, as well as cleaning and maintenance of passenger areas. The operator also allocates space and resources, both between airlines and concessionaires.

Based on this definition, airports simplistically speaking provide infrastructure and services at production costs and sell this product in the marketplace. Building on their carrier base, they create value by converting (effectively GDP-derived) air traffic in the form of aircraft movements, passengers and cargo into aeronautical and – increasingly more – commercial revenue. In general, aviation revenues are subject to economic regulation in terms of price caps, in order to prevent them from potentially charging monopoly rents. Figure 7.11 is a schematic illustration of an airport's business model.

Figure 7.11: The Airport Business Model




It was shown by this research that the key success factors of the airports' business model are operating efficiency, asset utilization and capital structure. In the operational context, operating efficiency and asset utilization are interrelated and include efficient management of traffic flows and optimal allocation of capital, maximizing the effectiveness of investment in productive assets. These value drivers which can be managed proactively are embedded into a framework of overall economic and derived

traffic development determining demand. Both, in turn, are subject to external effects and the prevailing regulatory environment with an influence on yield. Controlling value drivers and creating shareholder value is what the investor is concerned with (Shank & Govindarajan 1993).

Shareholder value is represented by the corporate value minus debt. Management creates value when corporate investments are made above the market-required rate of return or cost of capital, delivering the value creation margin. From management's point of view, the WACC establishes the market relevant hurdle rate against which success will be measured. It is an expression of which return the company has to earn in order to justify the employed financial assets or the opportunity cost of the assets in use. WACC is entirely market driven and investors may withdraw their funds in case the assets fail to earn this return. At the same time, it is sensitive to changes in gearing or leverage (Black et al 1998; Rappaport 1998).

Added shareholder value will materialize in increased returns on invested capital, growing enterprise value and the appreciation of the share price for companies which are publicly quoted. Managing the value of airports requires a sound understanding of the underlying economics.

## 7.4 Airport Economics

Airports are costly to build and costly to run. Substantial sums need to be invested in assets which have no alternative use, to satisfy demand which is basically controlled by the airlines. The positive aspect of such a capital intensive industry is the high operational gearing. Once runway and terminal capacity is in place, traffic growth can usually be accommodated with relatively modest increases in variable costs (Doganis 1992; SBC Warburg 1995).

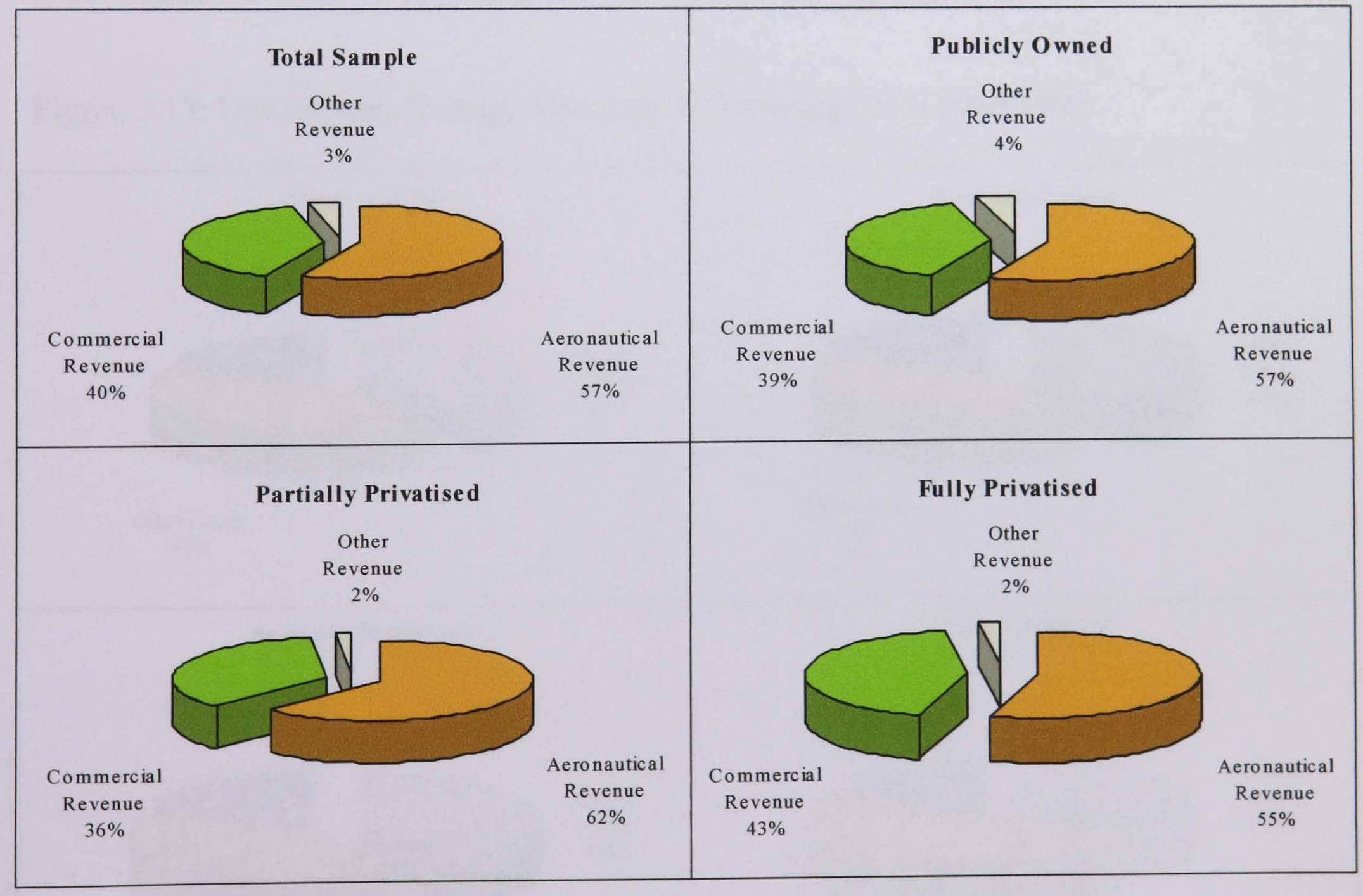
Determining the future cash flows and predicting prospective capital expenditure in order to project future earnings in the attempt to assess a firm's value is difficult. However, all crucial elements to the performance of an airport business as outlined in the airport business model have to be reflected by the company's investment cycle, by its cost, revenue and capital structure, and ultimately by its earnings and value.

The long-term average operating cost, revenue and capital structure of the sample airports give an overview of the underlying airport economics.

### 7.4.1 Cost and Revenue Structures

Figures 7.12 and 7.13 illustrate the long-term structure of revenues and operating costs of the total sample of airports as well as the sub groups.

Figure 7.12: Unweighted Average Revenue Structure of Sample Airports 1990-1999



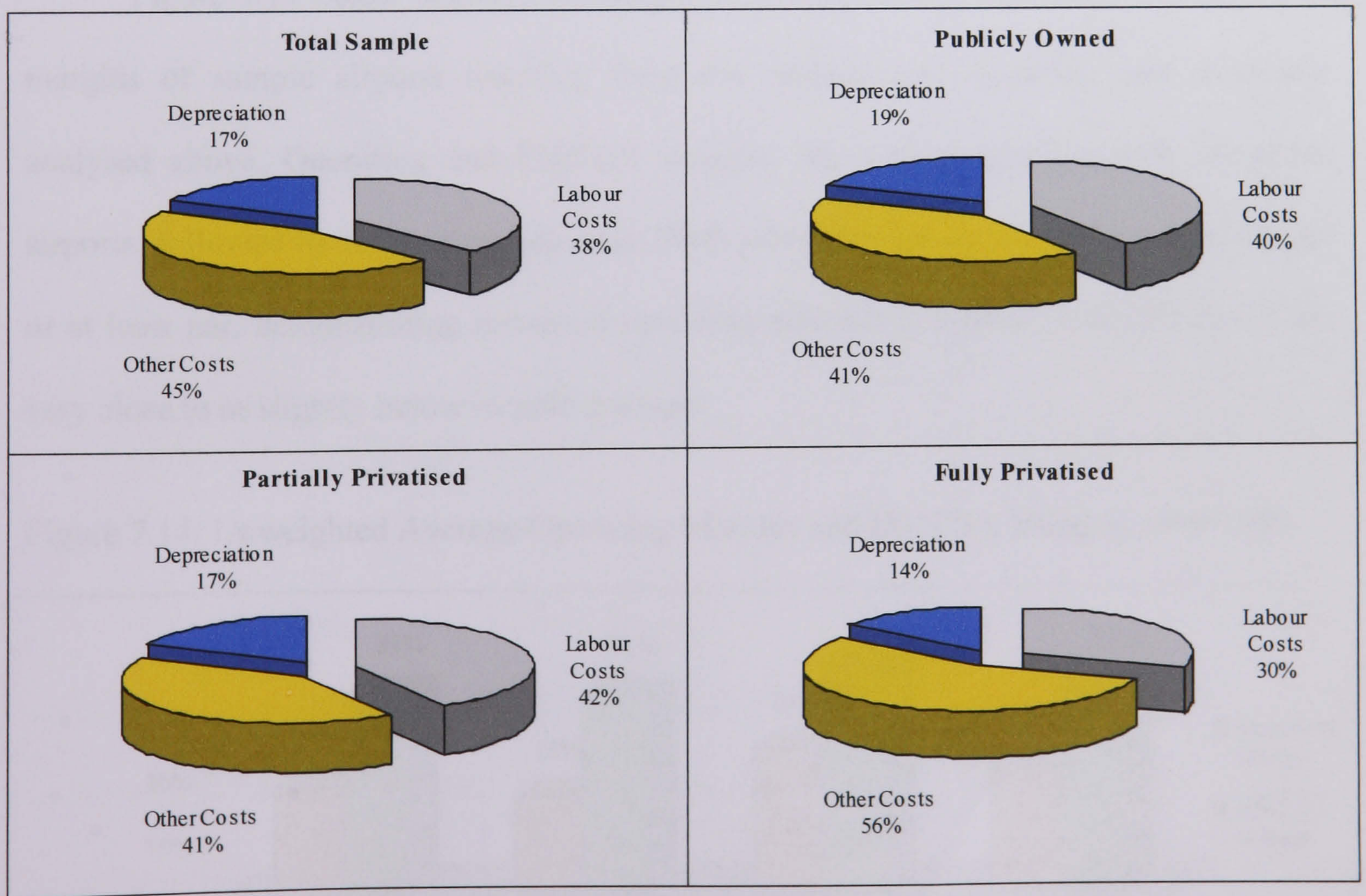

The structure of total revenues shows the highest share of aeronautical revenues with partially privatised airports (62%), followed by publicly owned ones (57%) and fully

privatised airports (55%). Commercial revenue is the complementary: 36% vs. 39% vs. 43%. Thus, fully privatised airports generate substantially more income from non-aeronautical activities such as retailing, while partially privatised ones are much more dependent on aviation income. It needs to be noted, however, that most sample airports' reports and accounts are neither very detailed nor consistent over the period under consideration regarding the classification of revenue. Therefore, the split into aviation-related, commercial and other revenue needs to be interpreted with some caution.

Aeronautical revenues make up for 57% of the total revenue of the total sample. The deviation of partially and fully privatised airports from the total sample average is approximately ± 2 to 5 percentage points. The revenue structure of publicly owned airports is very close to this sample average.

After this review of revenue structures of sample airports, the unweighted long-term average structure of operating costs is displayed in Figure 7.13.

Figure 7.13: Unweighted Average Structure of Operating Costs 1990-1999



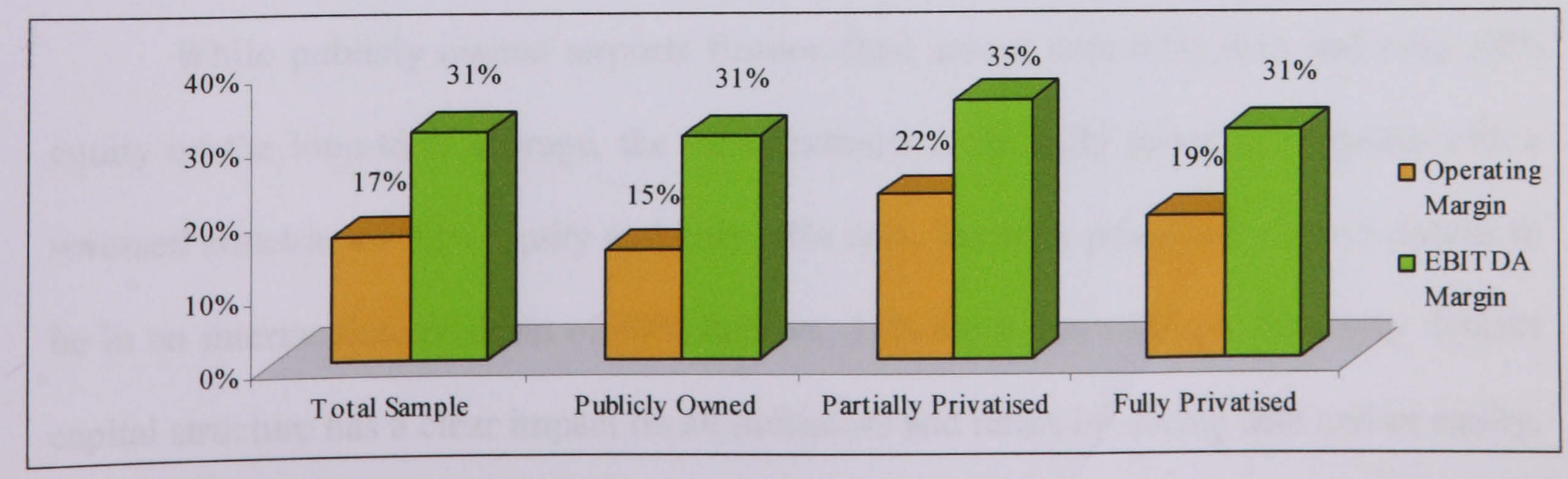
The cost structure shows the highest share of personnel expenditures with partially privatised airports (42%), followed by publicly owned ones (40%) and fully privatised airports (30%). Other operating costs go to the opposite direction: 41% vs. 41% vs. 56%. This is the same sequence as regards revenue above.

Depreciation is fairly similar with publicly owned airports (19%) and partially privatised airports (17%) and the sample average accounting for 17%, since the business is so intensive in tangible fixed assets. The fully privatised airports' depreciation share of operating costs, however, is only 14% on the long-term average.

Staff and other operating costs of partially privatised and publicly owned airports are also relatively close to sample average, whereas fully privatised airports deviate considerably in this respect. This shift from personnel to other costs indicates outsourcing of activities to third parties. As it is the case regarding revenue, operating and specifically ground handling-related staff costs of individual airports vary based on the scope of services provided.

Figure 7.14 below displays the long-term average EBIT (operating) and EBITDA margins of sample airports resulting from the revenue and operating cost structures analysed above. Operating and EBITDA margins are highest with partially privatised airports, followed by fully privatised ones. Both groupings are above total sample average or at least par, demonstrating increased operating efficiency. Publicly owned airports are very close to or slightly below sample average.

Figure 7.14: Unweighted Average Operating Margins and EBITDA Margins 1990-1999



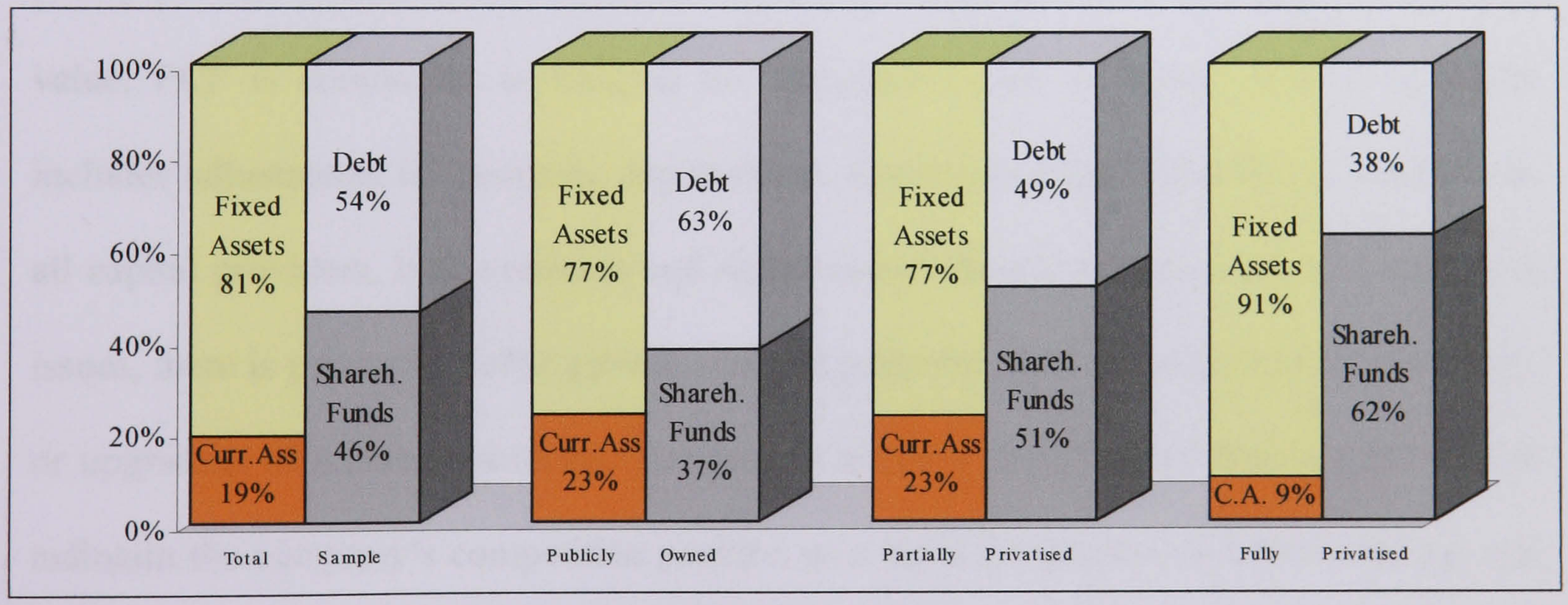
The distinct operating efficiency of sample airports is clearly reflected by related indicators and ratios of the between-group comparisons in Chapter 6.

### 7.4.2 Capital Structures

As a matter of principle, airports are capital-intensive businesses with huge balance sheet totals. Figure 7.15 illustrates the long-term average balance sheet structure of the total sample as well as the sub groups of publicly owned, partially privatised and fully privatised airports.

The assets and capital structures – the approach of financing the productive assets – show pronounced differences between the sub sets. Whereas the variations between fixed and current assets are generally moderate with the exception of very low current assets of fully privatised sample airports, the main distinction is the proportion of debt to equity on the liabilities side.

Figure 7.15: Unweighted Average Balance Sheet Structure of Sample Airports 1990-1999




While publicly owned airports finance their assets with 63% debt and only 37% equity on the long-term average, the other extreme is the fully privatised airports with a reversed structure of 62% equity and only 38% debt. Partially privatised airports appear to be in an intermediate position of 49% debt vs. 51% equity on average. This very distinct capital structure has a clear impact on all indicators and ratios involving debt and/or equity.

It has been discussed earlier that – in a world of corporate income taxes where interest payments are deductible as an expense – there is a substantial advantage to the use of debt. As long as ROA exceeds the cost of debt, leverage is favourable since it is lowering the WACC. The greater the level of EBIT and the lower the probability of downside fluctuations, the greater and more stable the expected future cash flows and thus ability to service interest and principal payments, the greater the debt capacity. In general, financing decisions as reflected by the capital structure can affect the overall value of the company. The judicious use of leverage can lower the cost of capital and increase the market value per share. On the other hand, financial leverage magnifies the underlying business risk of the firm regarding the variability of earnings per share (Van Horne 1998).

### 7.4.3 Financing Growth – The Investment Cycle

Identifying the key factors for successful airport management involves the question which issues exert a predominant impact on future earnings in terms of free cash flow (FCF) and thus constitute the risks and chances of investing in an airport and ultimately its value. FCF is commonly considered the company's *true operating* cash flow, which includes adjustments for accruals, depreciation, amortization and taxes and is available to all capital providers, both creditors and shareholders. Separate from day-to-day operating issues, there is primarily traffic growth and alongside the need for additional infrastructure or upgrading of existing facilities. The sample airports' investment volumes necessary to maintain the company's competitive position as a basis for generating future earnings and for sustainable growth have a profound impact on free cash flow as well as productivity and financial ratios. These are in turn also of significant influence on the share price performance (Copeland, Koller, & Murrin 1996; SBC Warburg 1996b, 1997b; UBS 1996).

As shown earlier, economies of scale in operations are an economic characteristic of airports. As an airport increases traffic throughput, the cost per unit declines unto a

threshold of approximately four million work load units, before increasing returns to scale revert beyond the most productive scale size. Whenever major expansion and development programmes are undertaken, in contrast, which regularly are too large in relation to immediate traffic needs or which provide capacity too soon, the short to medium-term result is an increase in unit cost. This is caused by depreciation and interest charges as well as operating costs, including staff (Doganis 1992).

Capital investment in terminals and other airport facilities is undertaken as a step function. System capacity is normally added in large chunks which often lead to sizable mismatches between installed capacity and traffic usage. As with any other high fixed cost business, capacity – or asset – utilization is crucial. It is the key determinant of financial performance, because airports are so intensive in intangible fixed assets. And the situation is even further complicated, since usually the investment cycle extends over a long period of time (Doganis 1992; SBC Warburg 1996a).

Assuming that assets are not depreciated until they come into service, that interest costs are capitalized on major projects and even overall economic growth, the financial effects of a typical airport investment life cycle may be described by the main characteristics as listed in Table 7.5.

Table 7.5: Investment Cycle Profile

| | **New Investment Phase** | **Operational Phase** |
|---|---|---|
| Debt/Equity | Rising debt | Rapid de-gearing |
| Free Cash Flow | Negative | Expanding |
| Risks | Construction risk, overspending, disruption to traffic | Traffic levels, competition, regulation |
| Productivity | High and rising | Step change downward with commencement of operation, then rising |
| Direct Overhead | Modest growth | Step up, then modest growth |
| Depreciation | Steady | Step up, then steady |
| EBITDA | Accelerating | Growing, but more slowly |
| Interest | Capitalized element rising | Step up in interest charge, then declining |
| Pre-Tax Profit | Rising strongly | Step down, then rising |

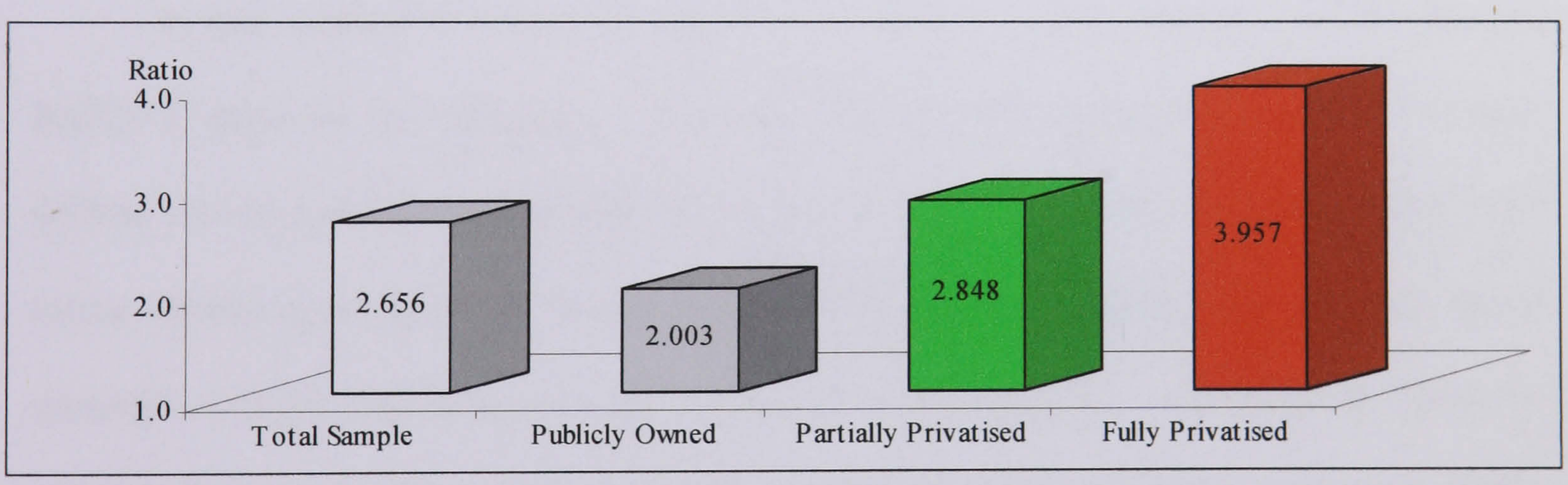
Source: SBC Warburg 1997a

The implications are obvious: Wherever possible, capital investment should be phased in a way that avoids too large or too early jumps in capacity installed via modular extension. The amount of capital involved in construction is immense and the payback period is very long. To accommodate the strong growth in traffic volume inherent in the aviation industry, however, demands adequate and timely expansion of facilities.

The capital expenditures involved have an immediate and dominating impact on earnings. The question that arises from the investor's point of view is whether or not earnings ultimately available for the distribution to shareholders after necessary reinvestment are reasonably controllable and thus predictable in such a business environment – or how shareholder value can be managed successfully in the airport industry. Figures 7.16 and 7.17 give a rather disillusioning impression.

Figure 7.16 displays the unweighted long-term average ratios of capital expenditure to depreciation.

Figure 7.16: Unweighted Arithmetic Mean of Capital Expenditure to Depreciation Ratios 1990-1999




This ratio demonstrates that depreciation on historical cost basis cannot pay for the investment of any sub group. Moreover, Figure 7.17 illustrates that although airports generate high amounts of cash, even total long-term average cash flow can hardly cover long-term average investment, which is already smoothening out the peaks of the investment cycle. On an annual basis, a temporary mismatch is very likely. The resulting funding requirements need to be financed by either debt or equity.

Figure 7.17: Unweighted Arithmetic Mean of Investment Coverage Ratios 1990-1999

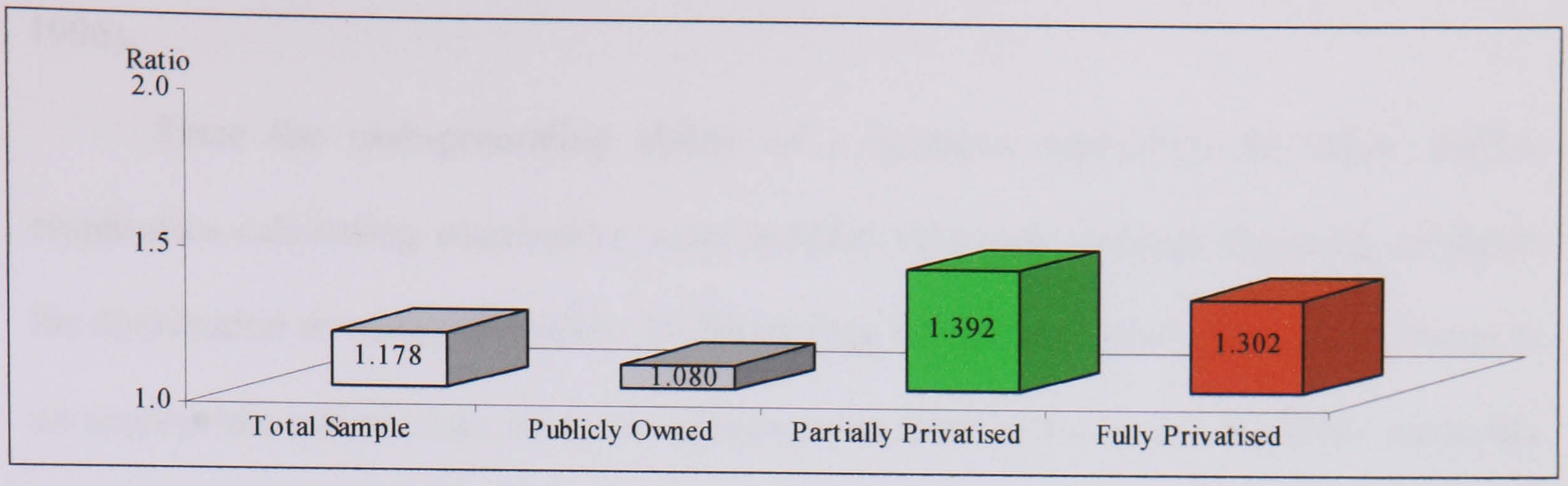



Figure 7.17 emphasises that the long-term average ratios of cash flow to capital expenditure are quite low. This holds explicitly true for publicly owned airports, where total cash inflow is hardly sufficient to cover investment. As discussed amongst descriptive statistics, capital expenditure versus total revenue (Figure 6.27) is equally high with partially privatised airports (33.25%) and the total sample (33.88%) as opposed to 46.19% with fully privatised and only 28.12% with publicly owned airports. This clearly has an effect on the asset base and derived ratios, such as WLU to total assets as well as fixed and total asset turnover.

In this context it is also of interest to calculate 'owner earnings' as per Warren Buffett's approach to valuating a business. Buffett, the renowned investment legend, defines owner earnings as the sum of net profit plus depreciation (equalling cash flow) minus capital expenditure or investment in productive assets which will generate future earnings. And the higher the ratio of fixed assets to net profit the more earnings need to be reinvested in the business instead of being distributed to shareholders (Hagstrom 1995; O'Connor 1996).

Buffett's approach in evaluating a firm's attractiveness as an investment in essence is similar to the DCF-method (discounted cash flow), which determines the enterprise value of a firm by discounting the stream of cash flows at the weighted average opportunity cost of capital of the firm. The financial tenets by which he values both managerial excellence and economic performance are focusing on return on equity and

calculating owner earnings to get a true reflection of value (Hagstrom 1995: O'Connor 1996).

Since the cash-generating ability of a business determines its value, Buffett emphasises calculating shareholder value in terms of owner earnings ultimately available for distribution to equity providers. In discounting the net cash flows expected to occur at an appropriate interest rate, all kinds of businesses seem to become comparable economic equals. From Buffet's standpoint, however, this often misleading yardstick has to be complemented. This is especially so with businesses which require ongoing capital spending like a (rapidly) growing asset-heavy airport, because it neglects one critical economic fact: Capital expenditures. The decisive question is, how much of the year's earnings have to be reinvested to maintain the achieved position. Hence, the company's cash flow has to be lessened by the amount of necessary capital expenditures and any additional working capital that might be needed (Hagstrom 1995).

Buffett's merit is that he clearly articulates that in determining the value of a business it is important to keep in mind that not all earnings are created equal. Companies with a high ratio of fixed assets to profits – which clearly applies to airports – require a larger share of retained earnings to remain viable. Thus, accounting earnings need to be adjusted to reflect the cash-generating ability. Owner earnings based on this definition have been calculated and summarized in Table 7.6 for the three ownership groups. The full details are displayed in Appendix B.4, Financial Ratio Analysis.

Table 7.6: Unweighted Average Owner Earnings of Sample Airports 1990-1999 (in '000 €)

| Total Sample | Publicly Owned | Partially Privatised | Fully Privatised |
|---|---|---|---|
| -13,677 | -17,741 | -9,980 | -6,518 |

BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
The BAA Group is excluded to avoid double counting.

Consistent with the findings regarding the capital expenditure to depreciation ratio (Figure 7.16) and the investment coverage ratio (Figure 7.17), Table 7.6 reveals negative

long-term average owner earnings for all sub groupings and the total sample. From Buffett's perspective this means that airports effectively did not produce distributable earnings for the period of 1990-1999.

From an investor's perspective, owner earnings are more helpful than the metric of free cash flow in determining the amount ultimately available for the shareholders – after taxes and the necessary reinvestment needs to maintain the company's competitive position as a basis for generating future earnings and for sustainable growth. This is the case since although FCF may be considered the company's *true operating* cash flow – available to all capital providers, both creditors and shareholders – which includes adjustments for accruals, depreciation, amortization and taxes, it neither includes interest payments nor repayments of long-term principals. The result is a hypothetical cash flow figure that would be available for distribution only if the company had no debt. And as established above, the actual amounts as well as the relative share of debt vary considerably amongst sample airports. While the results of the DCF-concept represent the return available to all capital providers, Buffett's approach is focusing on equity providers exclusively (Copeland et al 1996; Hagstrom 1995).

The investment volumes of the sample airports extremely affect owner earnings and free cash flow as well as productivity and financial ratios. Another problem characterizing any airport in respect of financing growth is that assets are not mobile but geographically fixed. As a matter of fact, airports share various qualities with property companies: Their assets are merely being leased out and they have rather little genuine control over their major customers. To a large extent, airports' destiny is in the hands of others, notably the airlines, which ultimately determine destinations and frequencies. The recent marketing practices of low-cost carriers are adding yet another dimension to this (Lawton 2002; SBC Warburg 1996b, 1997b; UBS 1996).

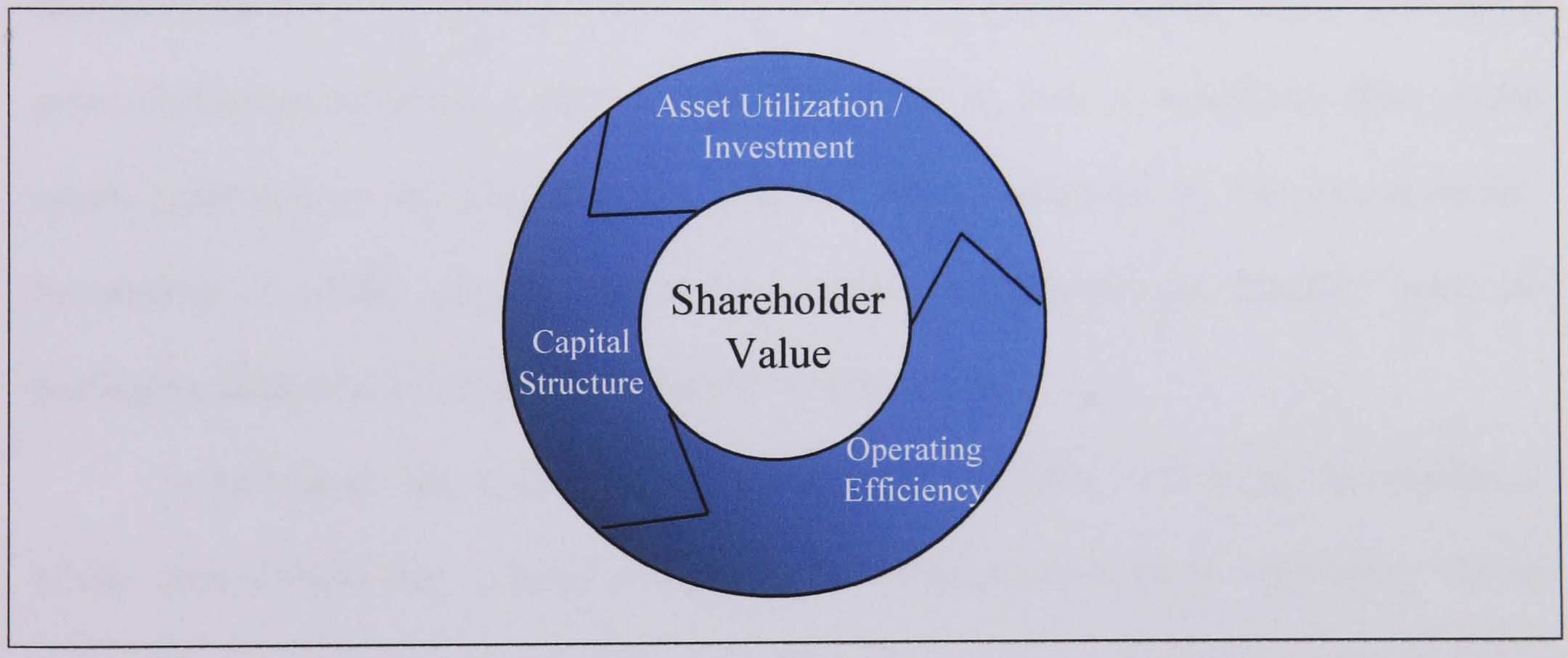
In combination with the investment cycle's impact, this characteristic substantially increases the risk profile. If anticipated passenger growth, for any reason, does not materialize, expensive new assets could be under-utilized for a considerable period of time and potentially result in financial distress (SBC Warburg 1995).

## 7.5 Value Drivers and Profiles

### 7.5.1 Key Success Factors and Value Drivers

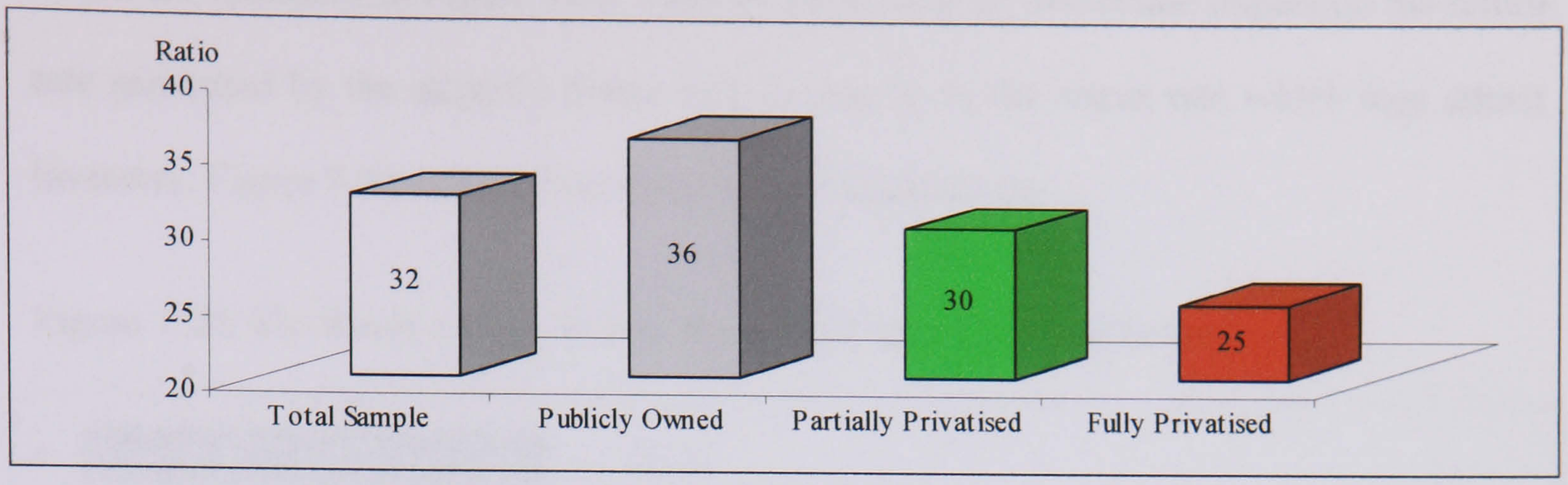
Identifying and understanding key success factors or value drivers is a prerequisite for controlling them and for creating shareholder value. Figure 7.18 below summarizes again the key success factors of the airport business which can be managed proactively as identified above.

Figure 7.18: Key Success Factors




Operating efficiency, asset utilization, as well as an appropriate capital structure are the key drivers of an airports value. Maximizing capacity utilization involves efficient management of traffic flows and optimal allocation of fixed assets investment as represented by the ratio of traffic throughput in terms of total WLUs to total assets. Figure 7.19 displays the long-term average asset utilization or capital productivity of total assets as discussed earlier.

Figure 7.19: Unweighted Arithmetic Mean of Asset Utilization Ratios (WLUs / Total Assets in '000) 1990-1999



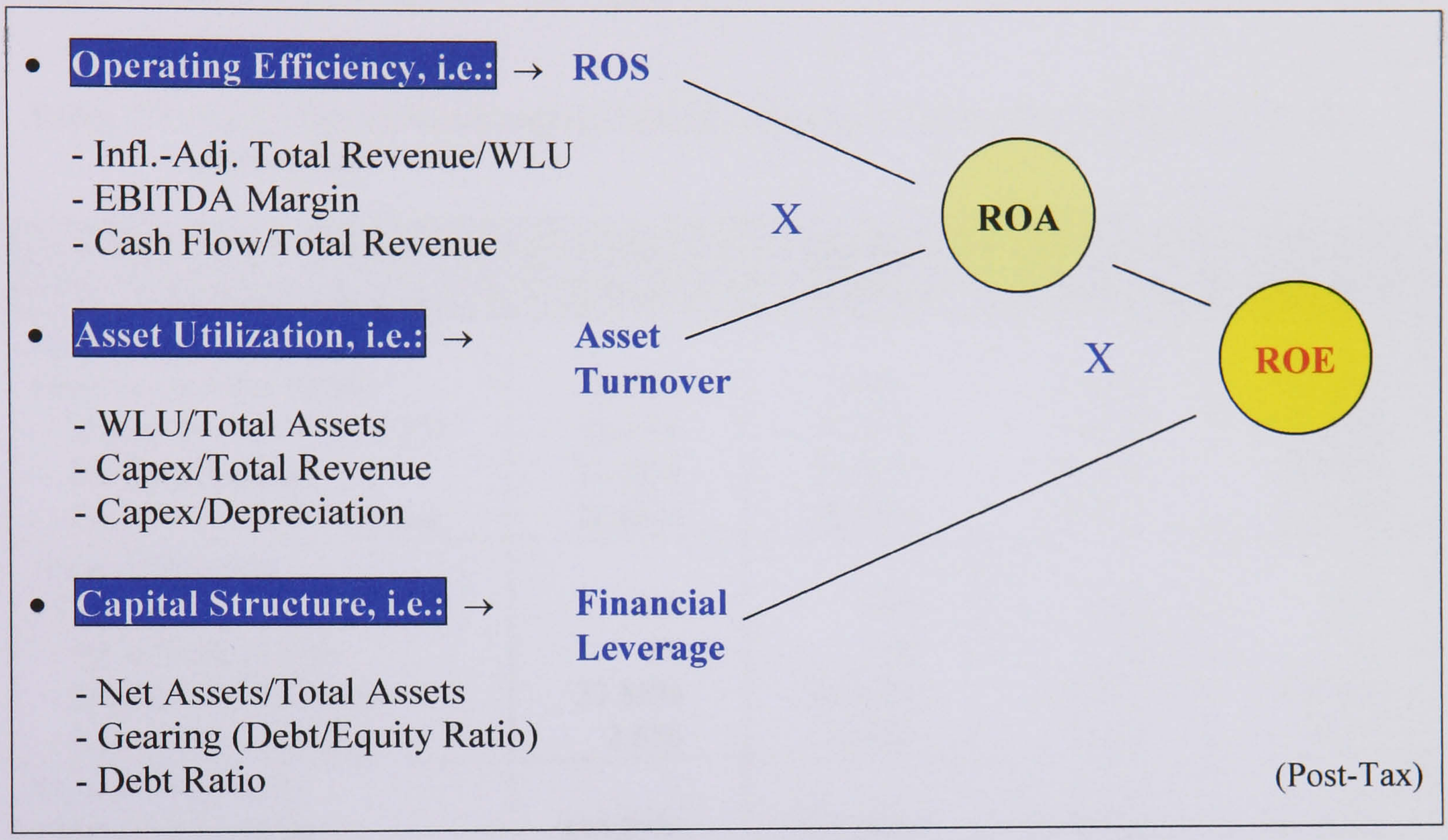

This graph illustrates that the relation of total traffic throughput to productive assets or asset utilization is distinctly different amongst the sample airports grouped per ownership criteria. This ratio is of course correlated with the respective capex/revenue (Figure 6.27) and capex/passenger (Figure 6.26) indices. Based on the discussion of the tremendous effects of capital expenditure on earnings and valuation it is obvious that especially the growth of the asset base needs to be managed thoroughly. In case investment grows faster than revenues, asset turnover will deteriorate with an immediate effect on the return generated by the airports assets and the return demanded by the private sector. Investment in traffic growth and possibly additional commercial facilities must be profitable; otherwise it will not be rewarded by the investor.

As per the results of this research presented in Chapters 5 and 6 and the mechanics of the 'airport value tree' (Figure 4.3) discussed in Chapter 4, the key value drivers of the airport business within a given framework of traffic demand and regulatory control have been identified as operating efficiency, asset utilization and capital structure.

Based on the business model derived above and the identified value drivers, an airport may want to increase aeronautical charges and retail penetration and/or decrease operating costs in order to improve its margin. At the same time, the growth in assets may be limited to stay behind increases in demand. And thirdly, the optimum gearing of the balance sheet may increase the return to common shareholders via financial leverage.

The key drivers themselves, in turn, are influenced by various factors, some of which are indicated in Figure 7.20. Each of those have an immediate impact on the return rate generated by the airport's assets and ultimately on the return rate which may attract investors. Figure 7.20 summarizes these causal relationships.

Figure 7.20: The Roots of Key Value Drivers and their Effect on Returns




Return on sales is primarily dependent on operating efficiency, which is driven by revenue generation and cost management, also reflected by the EBITDA margin. Asset turnover is dependent on sweating the assets in terms of high asset utilization or faster growth in revenues than assets. The product of return on sales and asset turnover results in the return on assets. The return rate generated by the airport's assets multiplied by financial leverage, which is determined by capital structure, finally results in return on equity. Tax deductible interest expense is lowering net income, thus decreasing ROA. The use of debt, however, decreases equity and as long as equity is lowered more than net profit, ROE will increase.

As demonstrated in the course of the extended data analysis (Table 6.7), return on sales, asset turnover and financial leverage tested significantly or even highly significantly

different between publicly owned and privatised airports. Furthermore, the latter group is rather heterogeneous and reveals marked differences also between partially and fully privatised airports. In principle, this significant difference also holds true with regard to the comparison of these ratios before and after partial or full privatisation (Table 6.9).

The value driver scorecard in Table 7.7 summarizes the determinants of value creation of the sample airports – strengths and weaknesses – grouped per ownership status.

Table 7.7: Value Driver Scorecard of Sample Airports (Unweighted Arithmetic Means 1990-1999)

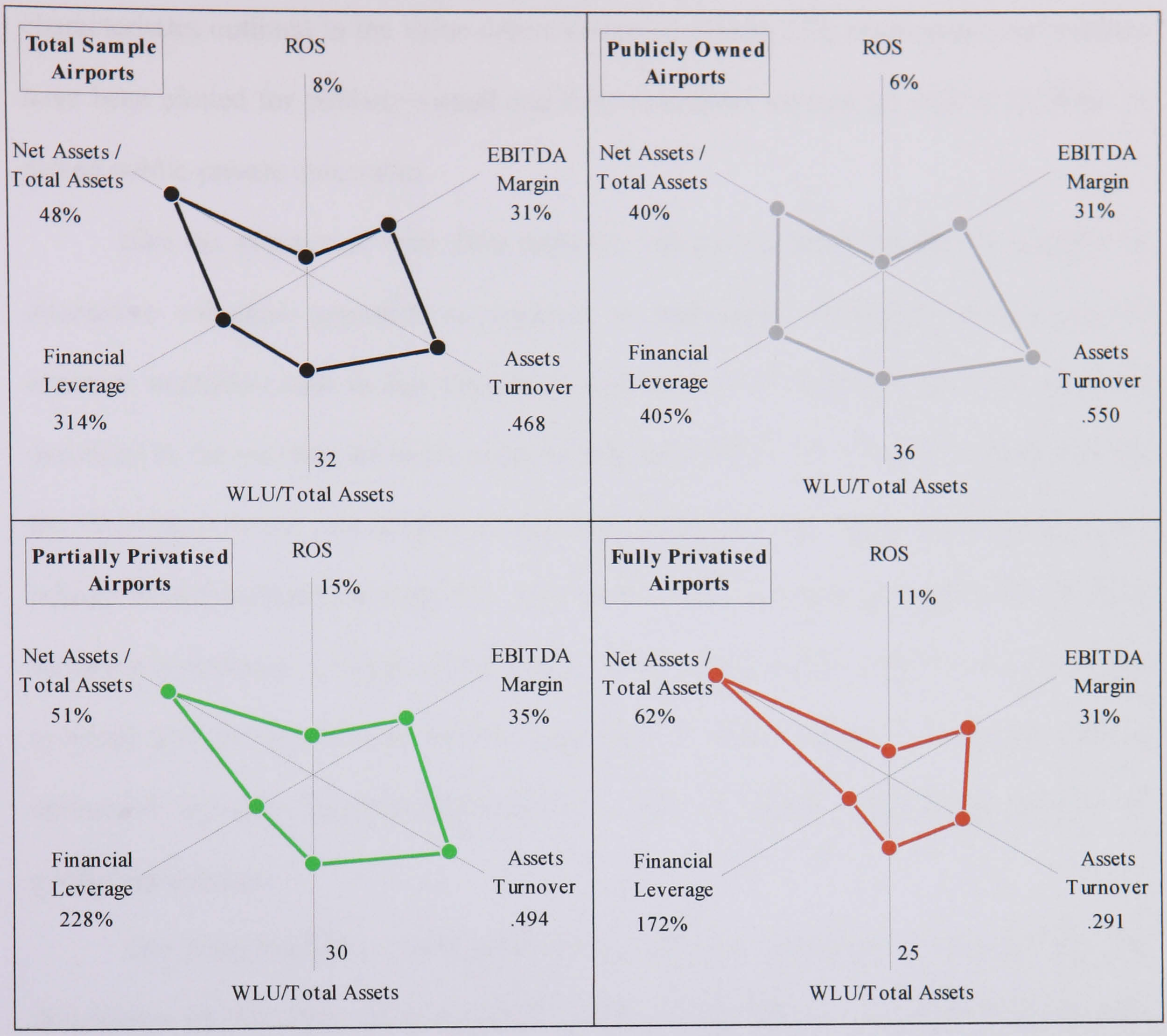
| Key Value Drivers / Components | Total Sample | Publicly Owned | Partially Privatised | Fully Privatised |
|---|---|---|---|---|
| **Operating Efficiency** | | | | |
| • Return on Sales (ROS) | 8.47% | 5.96% | 15.05% | 11.32% |
| - Total Revenue/WLU ('95) | 16.10 € | 17.24 € | 18.67 € | 12.84 € |
| - EBITDA Margin | 31.22% | 30.51% | 35.36% | 31.23% |
| - Cash Flow/Total Revenue | 22.86% | 21.69% | 28.17% | 23.39% |
| **Asset Utilization** | | | | |
| • Total Asset Turnover | .468 | .550 | .494 | .291 |
| - WLU/Total Assets | 32 | 36 | 30 | 25 |
| - Capex/Total Revenue | 33.88% | 28.12% | 33.25% | 46.19% |
| - Capex/Depreciation | 2.656 | 2.003 | 2.848 | 3.957 |
| **Capital Structure** | | | | |
| • Financial Leverage | 314.27% | 404.56% | 227.55% | 171.91% |
| - Net Assets/Total Assets | 47.79% | 39.73% | 51.03% | 62.09% |
| - Gearing (Debt/Equity Ratio) | 214.27% | 304.56% | 127.55% | 71.91% |
| - Debt Ratio | 53.83% | 62.52% | 48.97% | 37.91% |

Note: Net assets/total assets and debt ratio of total sample and publicly owned airports do not add up to 100% due to different number of cases (GVA, BSL).

The value driver scorecard confirms again that partially privatised airports appear to be assuming an intermediate position, combining the best of both worlds.

Figure 7.21 is visualizing performance profiles based on a selection of key value drivers for the sample airports grouped per ownership criteria. The profiles illustrate the marked differences of sample airports in terms of operating efficiency, represented by ROS and EBITDA margin. The ratios of WLU/total assets and total asset turnover stand for asset utilization. Capital structure is reflected by the percentage of net assets to total assets and financial leverage.

Figure 7.21: Performance Profiles




Three representative characteristics of the performance profiles per ownership category above – ROS, total asset turnover and financial leverage – will be applied next as input to a framework developing return profiles over time.

### 7.5.2 Return Profiles

The implications of the investment cycle for earnings, productivity and financial ratios and ultimately for the share price performance of quoted airport companies are paramount. Therefore, conventional valuation measures are not particularly helpful tools for long-term evaluation of airport operators (SBC Warburg 1996b, 1997b).

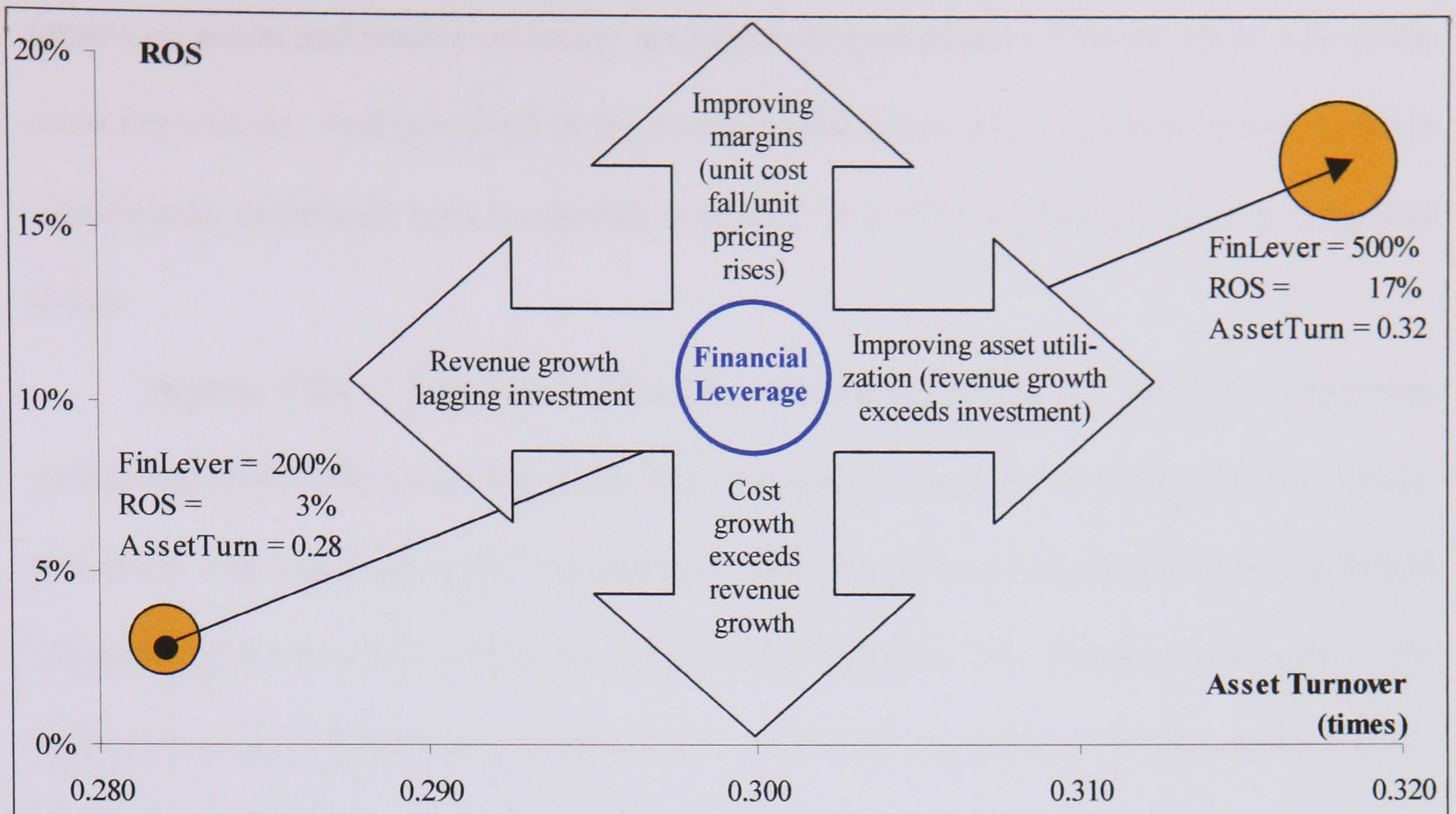
Based on the key value drivers summarized in Figure 7.20 and the major characteristics outlined in the value driver scorecard (Table 7.7), return paths and profiles have been plotted for publicly owned and fully privatised airports, as well as for those in mixed public-private ownership.

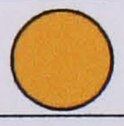
Like the discounted cash flow analysis, visualizing return profiles is actually an alternative valuation approach as opposed to traditional techniques or conventional earnings multiples such as the short-term snapshots of EV/EBITDA and P/E ratios as described in the excursus on share price performance. While DCF aims at looking through the investment cycle establishing a long-term valuation, the return profiles below are initially based on historical data. The very merit of this approach as opposed to the other valuation techniques is, however, that it gives a very clear picture of the underlying drivers involved and the direction as well as magnitude of improvements required in order to noticeably increase financial performance – and it clearly reduces the problem of predicting earnings.

The framework for visualizing return profiles is illustrated in Figure 7.22. The dimensions of this chart, asset turnover on the x-axis, ROS on the y-axis and financial leverage, represented by the size of the bubbles, are made up of the three drivers of returns. The compass card explains the economic meaning of the respective positioning of an airport within this co-ordinate system, at the same time indicating actions for improvements.

Increasing ROS will be caused by an improved operating margin, while a growth in costs exceeding the growth in revenues will result in the contrary. Revenue growth exceeding investment will accelerate asset turnover and vice versa. The magnitude of financial leverage is based on the respective capital structure in terms of gearing of the balance sheet. This is related – amongst other things – to debt capacity and credit standing and the value creating margin between the return on assets and the cost of debt.

Figure 7.22: Framework for visualizing Return Profiles – The three Drivers of Returns

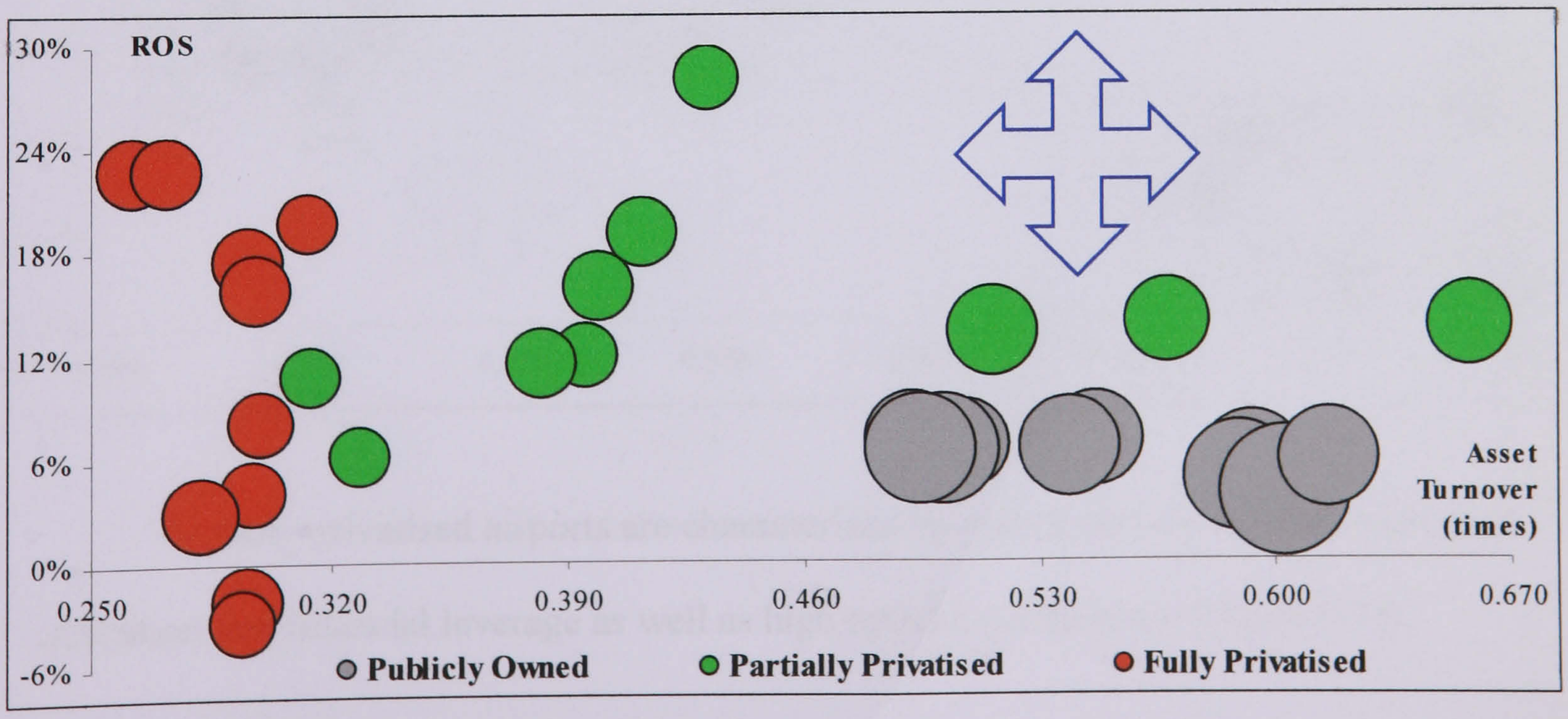



| | |
|---|---|
| ROS (Return on Sales) | Net Income over Total Revenue |
| Total Asset Turnover | Total Revenue over Total Assets |
| Financial Leverage | Total Assets over Shareholders' Funds |
|  | • The **size** of the bubble is determined by financial leverage.<br>• The **position** of the bubble is determined by ROS and asset turnover. |

Source: Illustration adapted from MSDW 2000

Figure 7.22 displays all three ownership groups of sample airports for the ten years under scrutiny according to the above described dimensions of total asset turnover (x-axis), ROS (y-axis) and financial leverage (represented by the size of the bubbles).

Figure 7.23: Positioning of Sample Airports per Ownership Criteria

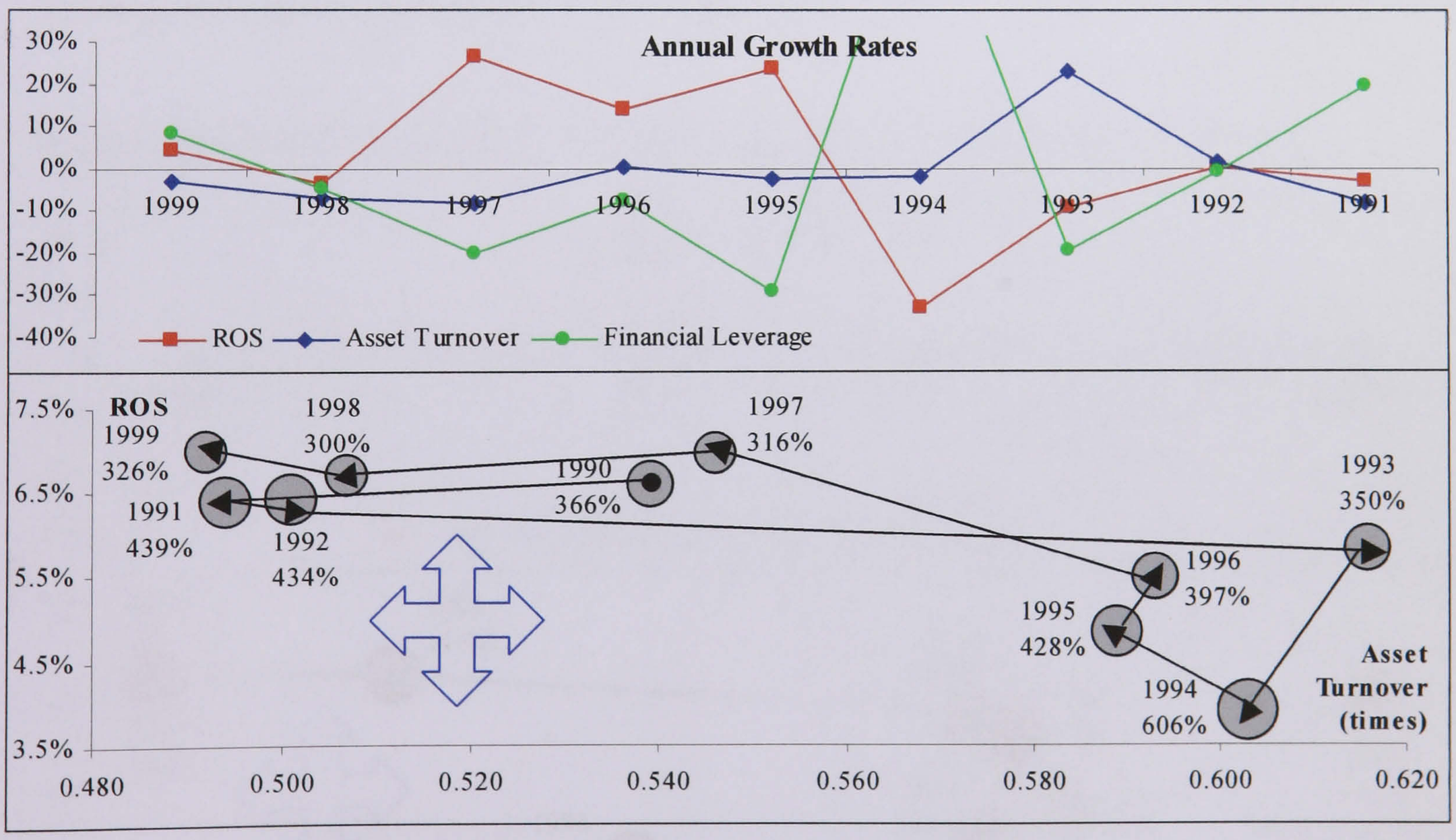


This graph illustrates that publicly owned, partially and fully privatised airports' returns on assets and returns on equity are based on considerably different intensities of the same key drivers. And as shown in the course of the t-tests and regression analyses this is significantly correlated with ownership structure on a 95% confidence level in statistical terms.

Figures 7.24 – 7.26 below illustrate individual profiles for the three ownership groups for 1990-1990 according to the same concept. It needs to be emphasised, however, that the x- and y-axis are scaled considerably different, as to accommodate for the different intensity of drivers. For additional information regarding the changing positioning, the year-on-year growth rates of the three drivers of returns are displayed in the upper portion.

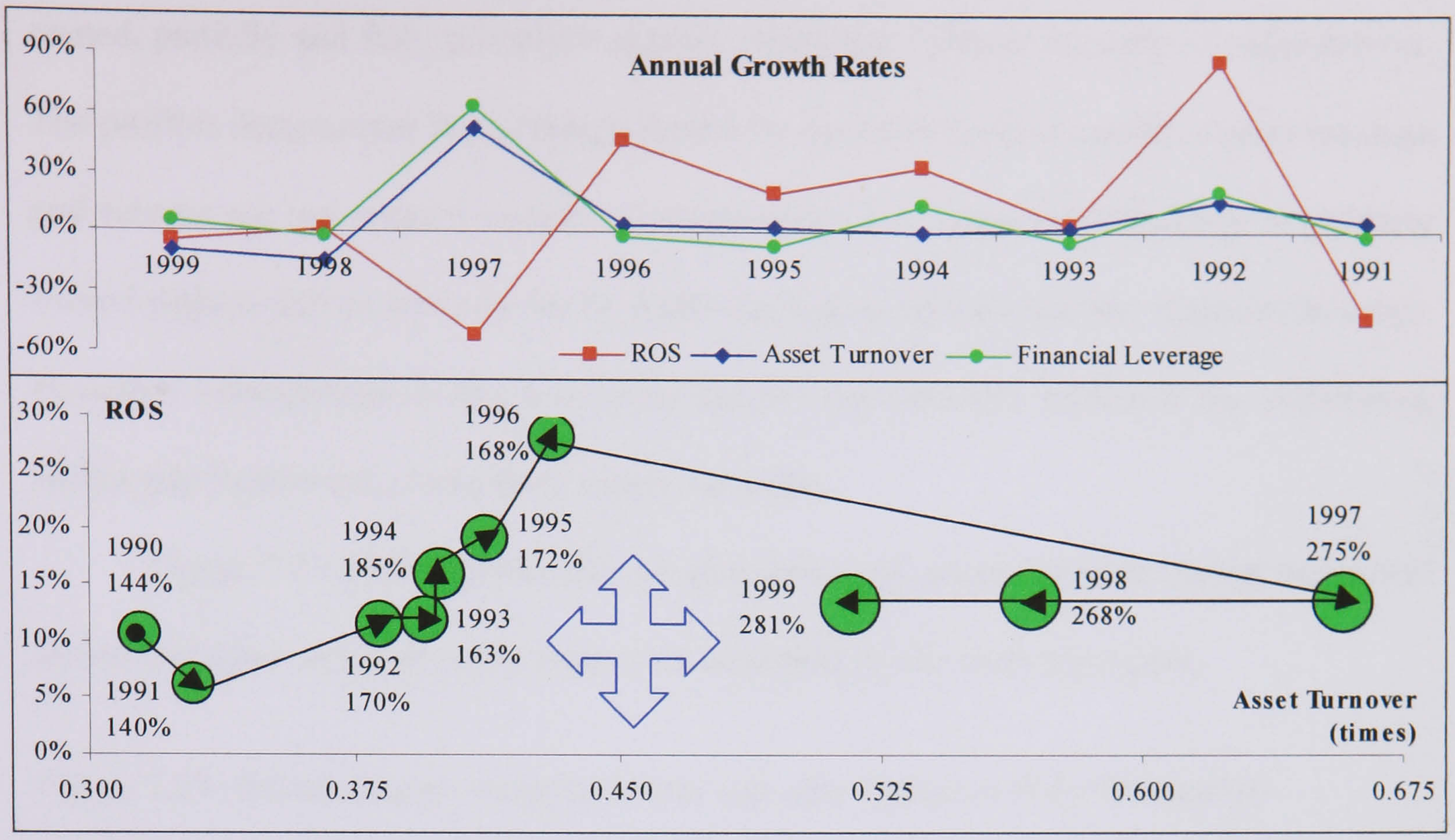
Figure 7.24 shows that publicly owned airports are characterized by comparatively high asset utilization and financial leverage and low operating efficiency.

Figure 7.24: Return Profile Publicly Owned Airports and Growth Rates of Drivers



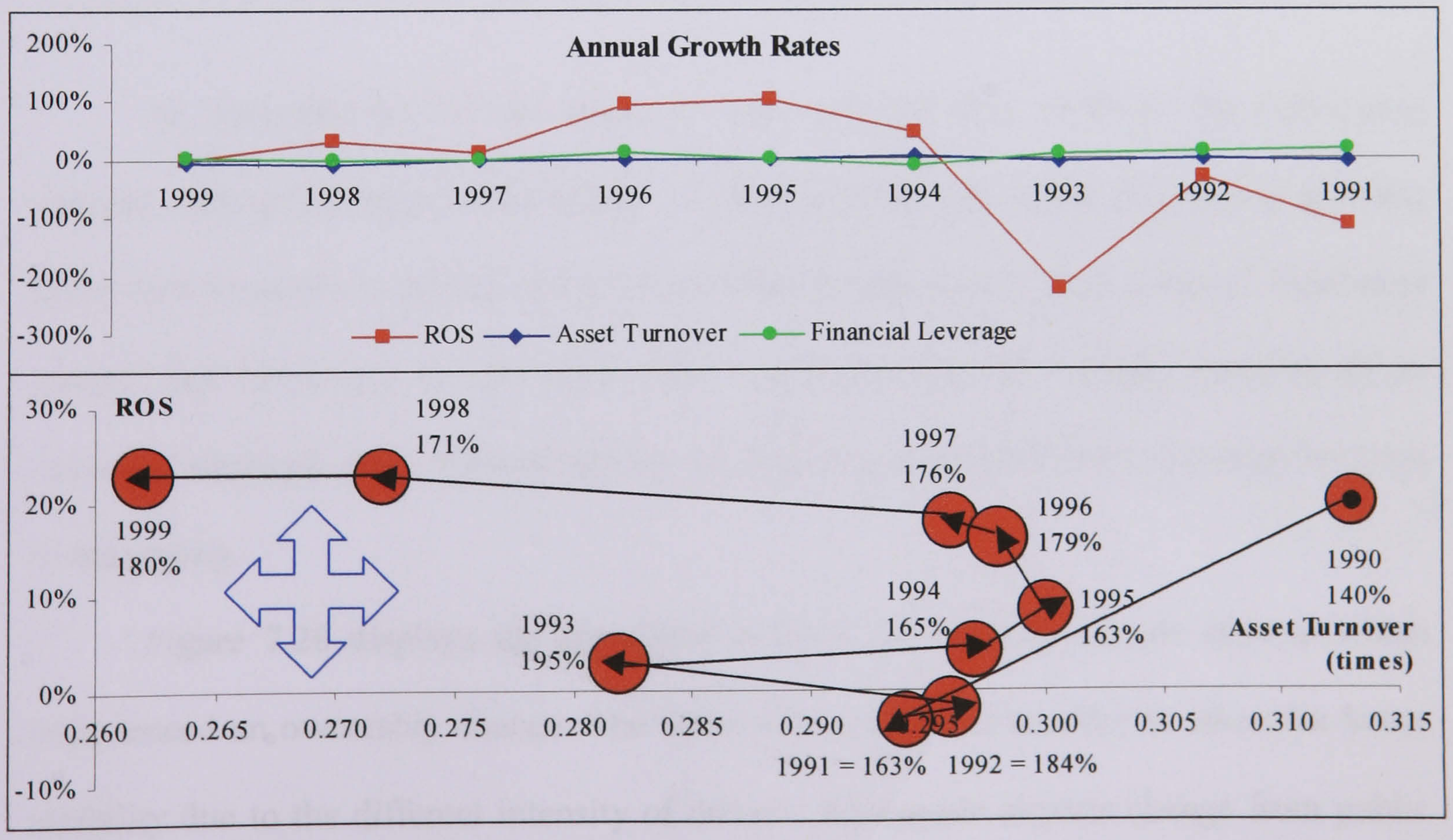

Partially privatised airports are characterized by comparatively medium high asset utilization and financial leverage as well as high operating efficiency (Figure 7.25).

Figure 7.25: Return Profile Partially Privatised Airports and Growth Rates of Drivers




In contrast to publicly owned and partially privatised airports, fully privatised sample airports are characterized by comparatively low asset utilization and financial leverage and high operating efficiency (Figure 7.26).

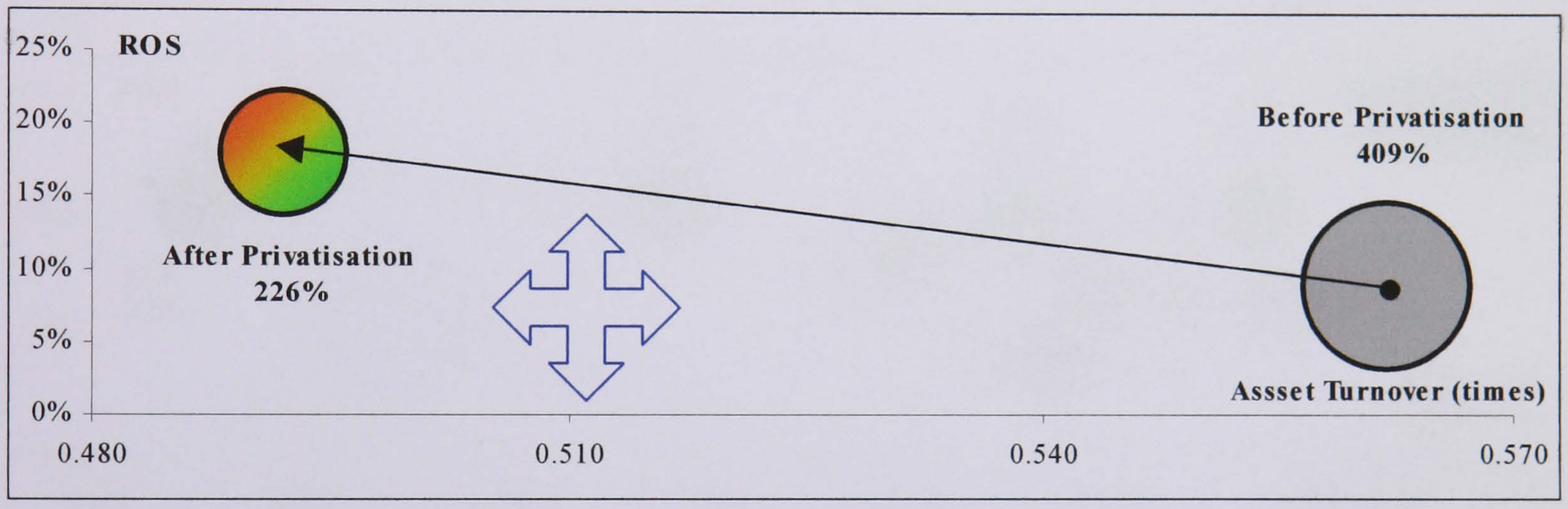
Figure 7.26: Return Profile Fully Privatised Airports and Growth Rates of Drivers



The individual return profiles above visualize *the* distinctive features of publicly owned, partially and fully privatised airports, being the different intensity of value drivers. The profiles demonstrate that although footed on the same business model, airport earnings and returns are not created equally. Comparatively low operating efficiency of publicly owned airports can be made up for by relatively high asset turnover and financial leverage. Proactive management of the key value drivers can certainly influence the positioning within this framework, controlling return and value.

Figure 7.27 illustrates the distinct positioning of sample airports during the period before and after partial or full privatisation according to the same principles.

Figure 7.27: Paired-Sample Airports before and after Partial or Full Privatisation




As demonstrated by the results of the extended data analysis, the positioning changes with an increase in the degree of privatisation. Investment spending is growing faster than revenues, resulting in decreased asset utilization and asset turnover. Operating margin and efficiency, on the other hand, are increasing on average, resulting in an increased return on sales. Represented by the smaller size of the bubble, financial leverage is decreasing.

Figure 7.28 displays the individual profiles for the nine sample airports which experienced an ownership change. The scale size is different in order to allow for better visibility due to the different intensity of drivers. All sample airports change from public ownership (grey) to either partially (green) or fully privatised businesses.

Figure 7.28: Return Profiles of Sample Airports under changing Ownership

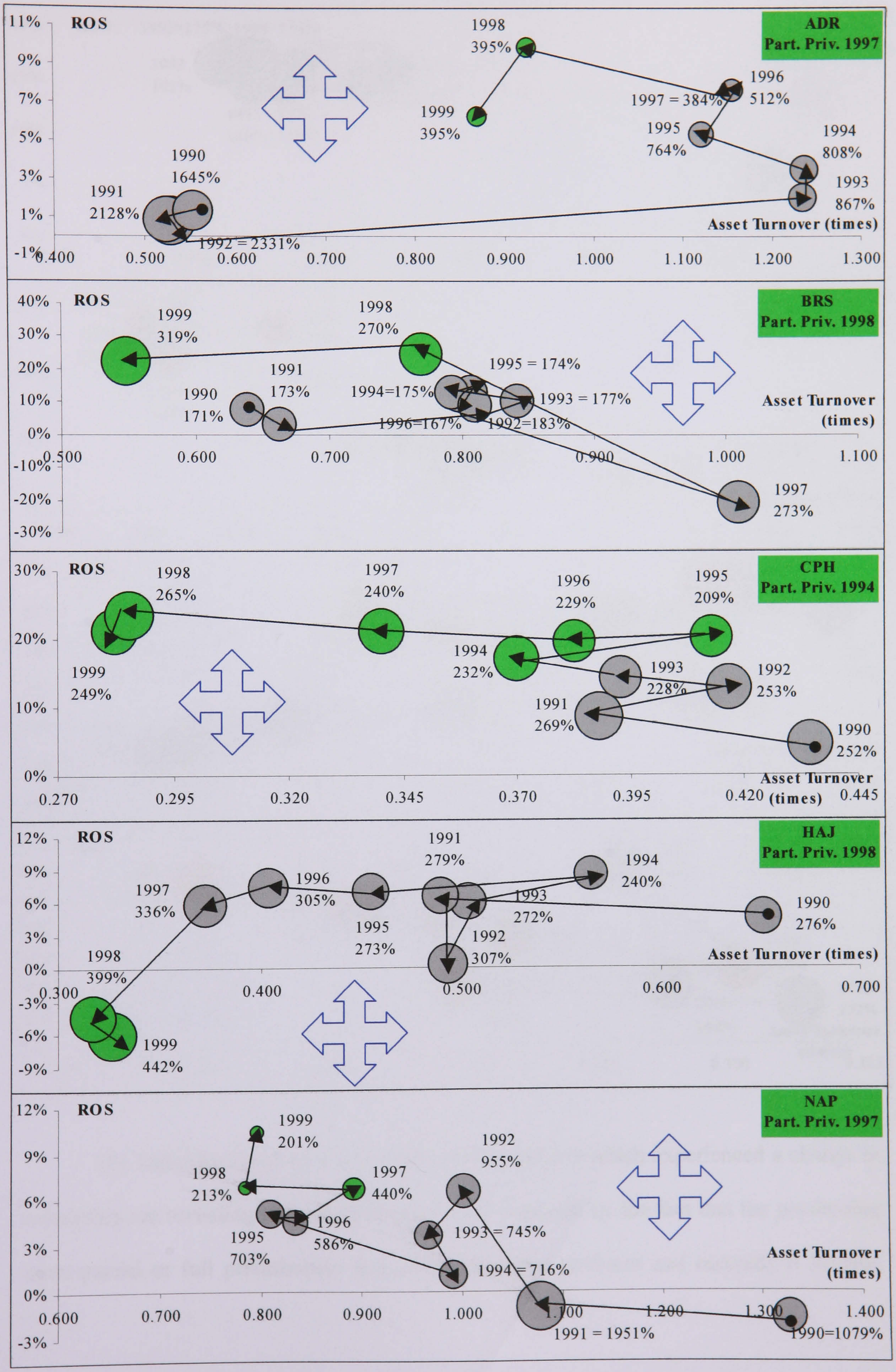
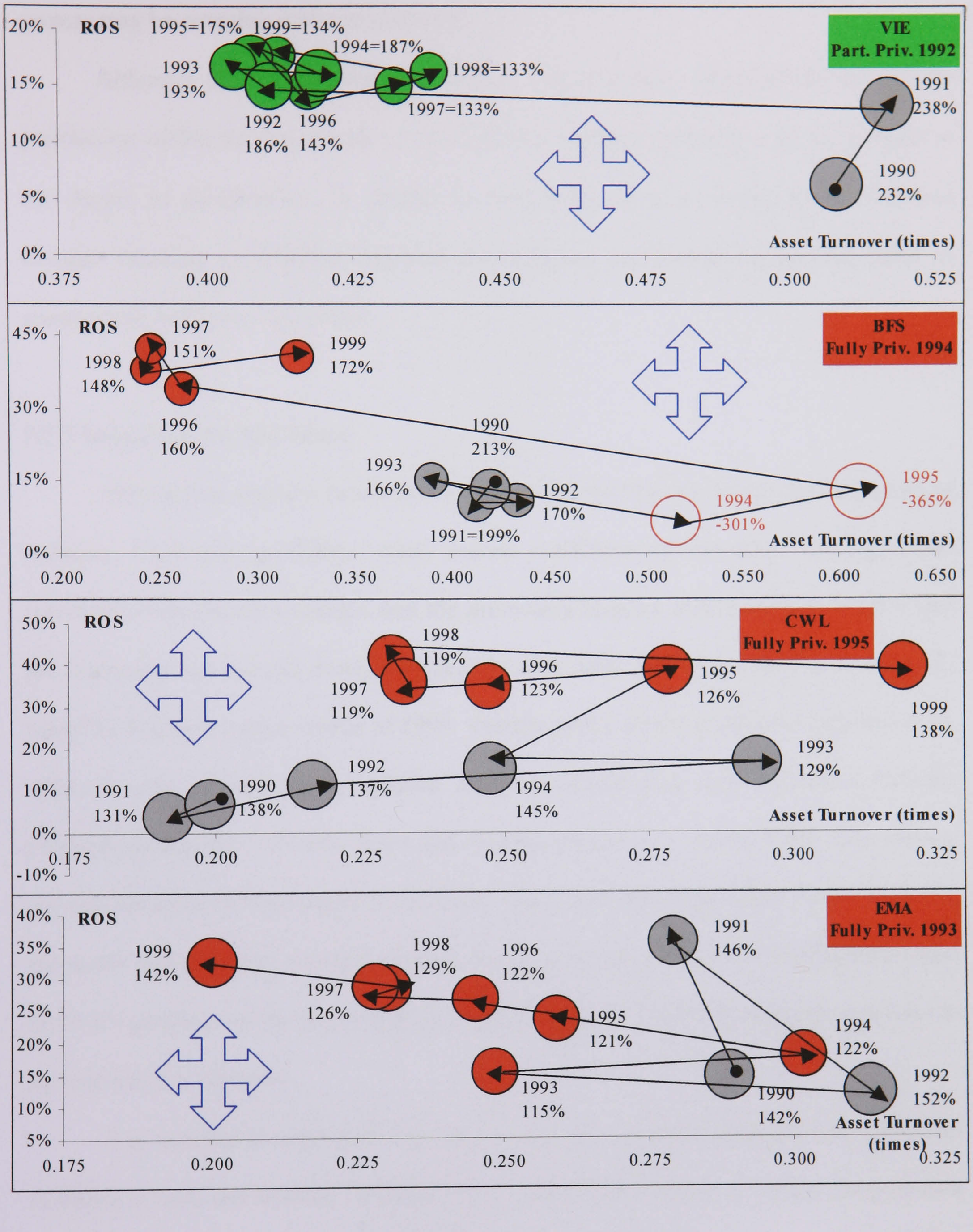


Figure 7.28: Return Profiles of Sample Airports under changing Ownership (cont'd)




The individual profiles for the nine sample airports which experienced a change in ownership are revealing a disparate picture. This is caused by the fact that the positioning upon partial or full privatisation was obviously rather different and secondly it became

effective at different points in time. In addition, each airport is an individual business and owners may be pursuing different strategies.

Although the development is different, the common characteristic is that the positioning within the framework of value drivers changes markedly with an increase in the degree of privatisation. A change in ownership structure brings about structural changes resulting in different financial performance, confirming the general trend as summarized in Figure 7.27 above.

### 7.5.3 Balancing the Key Issues

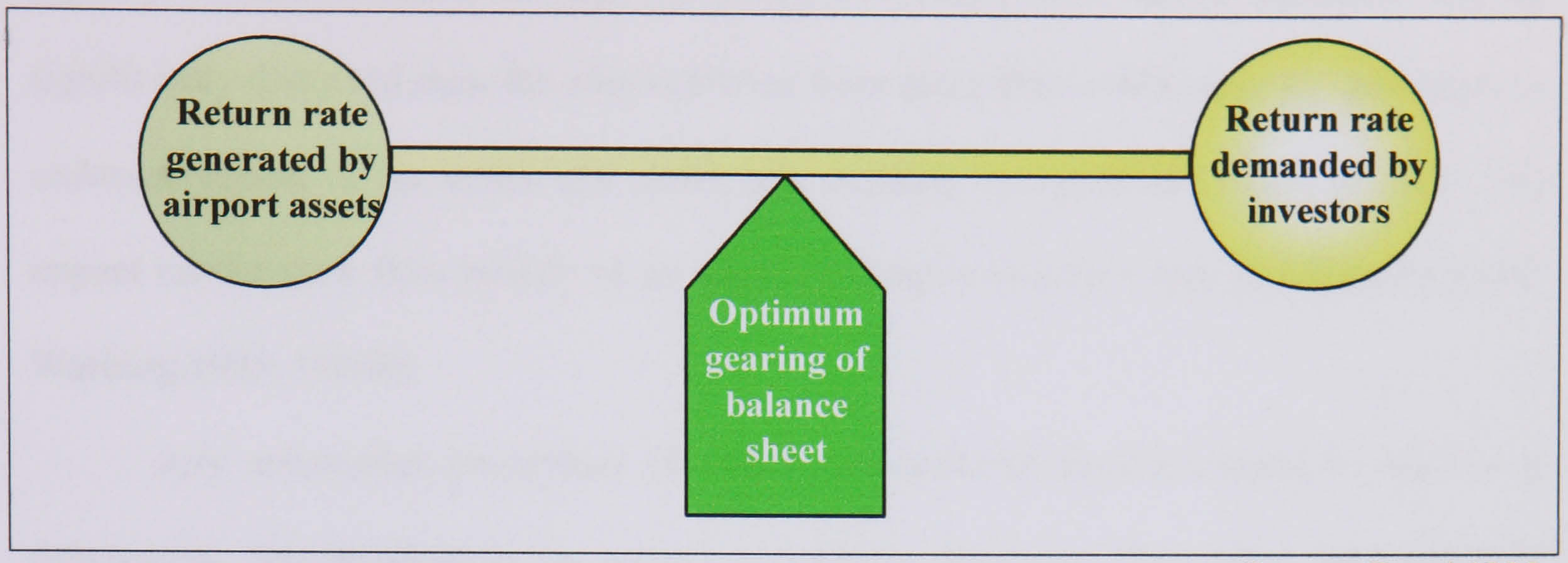
Maximizing capacity utilization appears to be *the* formula of success in the airport business. Especially nowadays, when market conditions do not allow for significant increases of aeronautical charges and the previously familiar ever-increasing retail spend per passenger has slowed down considerably even after recovery from the abolition of intra-EU duty-free by the middle of 1999. Volatile traffic development after September 11, 2001, is only intensifying the general problem. Maximizing asset utilization includes efficient management of traffic flows and optimal allocation of capital, finally maximizing the effectiveness of fixed assets investment, return rates and shareholder value. Sweating the assets and adjusting cost and revenue structures in the struggle to redefine the current level of operations as the most productive scale size appear to be the adequate measures to accomplish this objective.

It is essential to understand that airports are asset-backed businesses with long-term visibility of cost and revenue structures. This makes them attractive lending propositions for banks. As long as debt is cheaper than the return earned by the assets the funds are invested in, it is efficient to employ more capital in the business (UBS 1997).

Figure 7.29 visualizes a supposedly simple task for airport management which is a real challenge due to the very nature of this business: To keep a stable balance between the

return rate generated by the firm's assets and the return rate required by the private sector, by structuring the balance sheet appropriately to maximize shareholder value.

Figure 7.29: Balancing the Key Issues




Source: Freud 1995

What will ultimately determine successful management in this industry is the ability to phase capital allocation in such a way that it generates a maximum return. This requires project management as well as finance skills for a thorough phasing of major investment spending and an optimisation of the use of debt facilities and equity supply (Donald 1996).

The private sector will only participate in airport financing if returns are favourable in comparison to other investment opportunities. It demands evidence that airports operate cost effectively, develop innovative strategies and create and tap broad new sources of revenue. Therefore, airports will have to focus on being entrepreneurial commercial companies not state bodies managing infrastructure. Although demonstrated to a certain extent by partially and fully privatised operators, there still appears to be considerable potential for improvement regarding the development of additional retailing and commercial activities which make best use of the unique traffic flows of an airport and in optimising asset utilization as well as capital structures.

## 7.6 Summary

Aside from the sheer scale of investment which is required, the crucial issue for airports is that while passenger numbers usually grow at a relatively steady rate, airport capacity is often increased in large units. The economics of an airport operation will be significantly disturbed once the airport moves from more than 100% capacity utilization to under-utilization of its assets and some idle capacity designed for future growth. The impact on the cash flow profile of an airport in such a situation may be dramatic (SBC Warburg 1995, 1996b).

Any substantial investment in runway or terminal facilities tends to lead to a progressive deterioration in an airport company's finances. This basic scenario will become even more acute when depreciation steps up with the commencement of operations in the new facilities. It is not before utilization of installed capacity increases over time that productivity and margins improve and the firm starts to generate free cash flow again (SBC Warburg 1995, 1996b).

Given all the above-stated facts, it becomes quite obvious that it is most probably not only the recent overall economic situation but also the perceived threat of the enormous capital expenditures and its impact on earnings which prevents market participants to price the stocks of quoted airport companies at a level which demands lower returns than for the market as a whole. Share prices are rather sensitive to investment spending (UBS 1996; S&P 2003).

Although the cash-generating ability of airport companies is impressive, the generated cash flow levels can hardly cover capital expenditure. And since governments are unlikely to be capital providers, private sector sources for financing, both debt and equity, will be increasingly needed. Those airports, however, which are able to attract private funding by improving operating efficiency and thus profitability are likely to be able to take full advantage of the sector's projected long-term volume growth, which

remains basically intact despite the negative implications of war and terrorism. From the investor's point of view, airports are a safer play on the growth perspectives inherent in civil aviation than airlines, but they are neither immune to external tremor nor are they a homogeneous group. But in principle, airport stocks are more resilient than equity markets and investors appreciate their defensive characteristics (S&P 2003; DrKW 2004; Jane's Airport Review 2003).

Airports should not be valued with a single multiple but with measures recognising the key features of success of their value tree. In this context it is very useful to analyse the changes in return on sales, asset turnover and financial leverage, instead of exclusively considering conventional benchmarks for performance measurement being revenue enhancement and reduction in operating costs. But in addition to that, necessary capital expenditures to accommodate growth and to maintain the competitive position of the business as a basis for future earnings have to be accounted for. Based on a number of solid assumptions, alternative valuation techniques may also be applied to medium-term projections (MSDW 2000).

Although footed on the same business model, not all airport earnings are created equally. Functional similarities are masking profound operational and financial variations. Comparatively low operating efficiency of publicly owned airports can be made up for by relatively high asset turnover and financial leverage. The individual return profiles visualize *the* distinctive features of publicly owned, partially and fully privatised airports, being the different intensity of the ultimate value drivers. This is the added value of this valuation approach, which neither the traditional nor the alternative valuation techniques can accomplish.

# CHAPTER 8

# CONCLUSION AND OUTLOOK

## 8.1 High Hopes on Airport Privatisation

High expectations had been placed on airport privatisation in the mid-nineties. Analysts argued that as technology improved mobility, airports had and continuously would have to readjust by becoming a new service industry. That more individuals had access to air transportation than ever before and the entire aviation industry was characterized by ever-increasing competition. With new management ideas and creative financing, airports were about to enter the 21st century and that the business environment of this sector was in the midst of unprecedented change (Salomon Brothers 1996).

Several European hubs and also regional airports have been partially or even fully privatised in the meantime, and some of those are listed at a stock exchange. Airport privatisation has taken various schemes. The majority of cases have been trade sales at EV/EBITDA multiples of between 15 and 20 times, representing a significant premium to the listed sector. Commercial airports clearly have the potential to be run as profitable private companies, but most of them have a mixed track record. Even after two decades, airport privatisation continues to be an important issue. The steady pipeline of transactions, however, still has not yet materialized, although frequently announced over the last ten years (Aviation Strategy 2003; Deutsche Bank 2000).

Whereas the trend of airport privatisation originating from Europe had led the industry to considering a shift to private ownership on a worldwide basis during the second half of the '90s, this development has almost ground to a halt. The majority of airports are still being operated by public entities. Global economic recession and external events like the terrorist attacks on September 11, 2001, and the Iraq war and SARS epidemic in 2003, affecting the aviation industry as such, added to the reservation of strategic investors

caused by overheated markets and various difficulties due to the complexity of the subject matter and variety of models (Aviation Strategy 2003).

Estimates of future airport privatisation projects had ranged well into the hundreds, but in the aftermath of the events of September 11, 2001, the momentum has slowed down. Ever since, no one is rushing into the marketplace as towards the end of the 1990s. Also, because some previous deals have not turned out as advantageous to the various stakeholders as originally envisaged. There is still a high level of activity, but its nature has changed with, for example, more emphasis on secondary sales and public private partnerships. Frequently, the investors themselves are also quite different from earlier ones and so are their expectations (Bentley 2002).

It still holds true what had been stated almost a decade ago: The private sector only participates in airport financing if returns are favourable in comparison to other investment opportunities. It demands evidence that airports operate cost effectively, develop innovative strategies and create and tap broad new sources of revenue. Therefore, airports will have to focus even more on being entrepreneurial commercial companies rather than state bodies managing infrastructure. There still appears to be considerable potential, first and foremost optimal allocation of capital and maximizing the effectiveness of fixed assets investment including efficient management of traffic flows in order to maximize capacity utilization. And secondly, focusing on the customer base which has consolidated in global airline alliances and continued development of retailing and commercial activities in general to improve profitability (UBS 1996; Salomon Brothers 1996).

In short, the private sector's demand for return on invested capital requires an even more commercial and competitive approach to managing airports. There is nothing mysterious about privatisation. What will ultimately determine successful management in this industry is the ability to phase capital allocation in such a way that it generates a maximum return. This requires thorough phasing of major investment spending projects

and an optimisation of the use of debt facilities and equity supply. Privatisation allows management to focus on new avenues for funding expansion. It is this investment that enables airports to supply the required services, to keep pace with growth and to remain competitive. Having the incentive and the resources for implementing private sector efficiency will enable them to reward shareholders adequately (Salomon Brothers 1996; UBS 1996).

## 8.2 Hypotheses and Research Question Revisited

Against the background of the above and a general description of the airport sector it was claimed at the beginning of this study that privatisation could only be a successful strategy for this new millennium if private sector capital can be attracted to the market and the hypotheses derived from this were stated as follows:

i. Partially or fully privatised European commercial airports operate more efficiently than others.

ii. Partially or fully privatised European commercial airports are an attractive investment as compared to alternative capital projects.

In addition, the research question for the distinctive features characterizing financially successful airports was raised.

It was shown in the course of this research – based on a fairly representative sample of 35 airports and airport groups in terms of geographical location, and traffic volume and composition – that the first hypothesis is true, since partially and fully privatised European commercial airports actually operate more efficiently than publicly owned ones. The second hypothesis, however, is false regarding fully privatised airports, since there appear to be a variety of investment alternatives generating higher return rates; but it holds true for equity returns on airports in mixed public-private ownership.

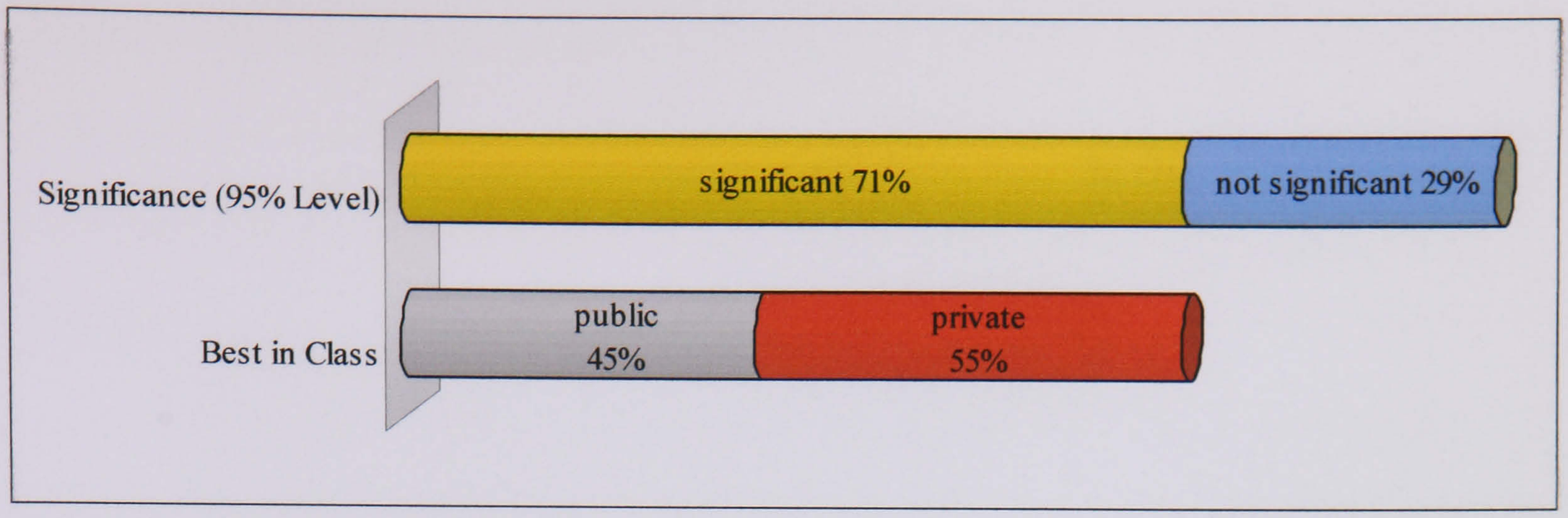
Several powerful research tools have been applied to investigate the subject matter from various angles, always from the investor's perspective. The analysis of partial factor productivity and financial ratios resulted in a detailed understanding of the financial performance of the sample airports. These findings were confirmed by data envelopment analysis. The analysis of total factor productivity spares the interpretation of a whole set of indicators and essentially gives a general indication in terms of a single unitless index on a highly aggregated overall level. DEA also revealed scale inefficiencies due to failure in achieving the most productive scale size. Returns to scale decrease beyond a threshold of approximately four million work load units while sample airports below this volume demonstrate economies of scale.

The excursus on share price analysis of the quoted sample airports showed a somewhat diverse picture of listed sample airports and emphasised the common characteristic of susceptibility to external events and the resulting effects on enterprise value. This, of course, applies to any business which is listed at a stock exchange.

In general, the key success factors of the airports' business model within a more or less given framework of overall economic development and a prevailing regulatory regime are operating efficiency, asset utilization and capital structure. Likewise, these are the main drivers of financial performance and ultimately shareholder value. Publicly owned, partially privatised and fully privatised airports are characterized by distinct intensity of these key drivers, distinct return profiles and financial performance.

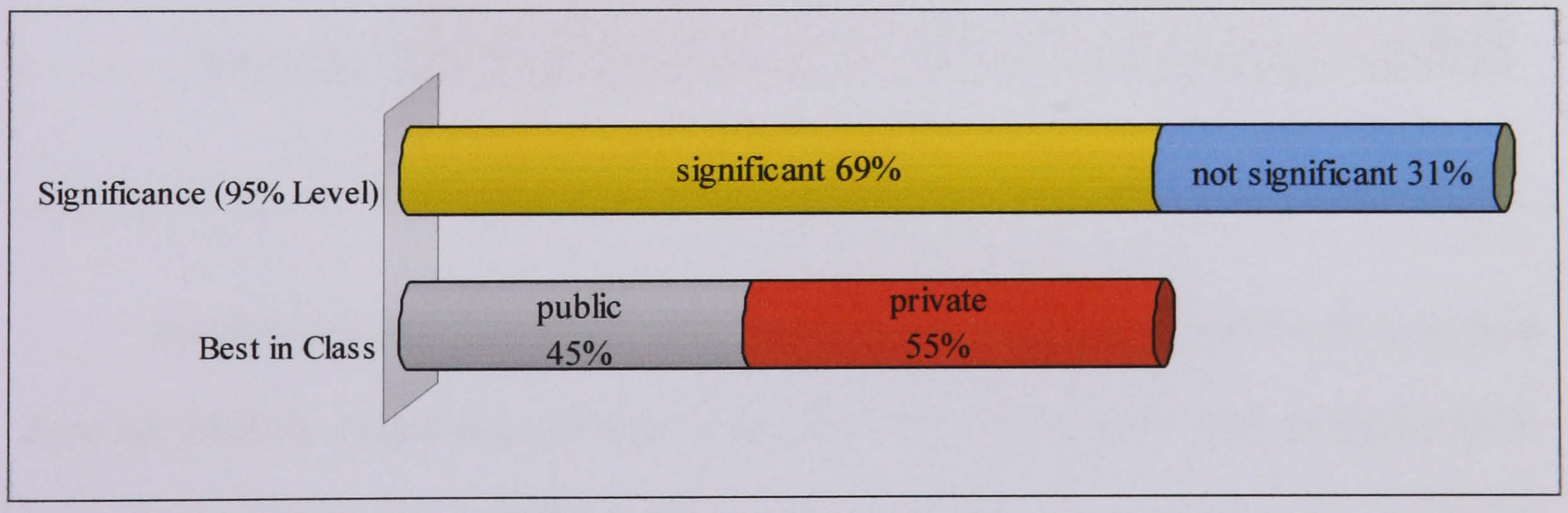
The independent t-test revealed economically meaningful and statistically significant or even highly significant differences between publicly owned and privatised airports for more than 71% of all indicators and ratios (Figure 8.1). With the significant cases, privatised sample airports appear to be 'best in class' in 55% as opposed to 45% as regards publicly owned ones. The group of publicly owned airports achieves higher values particularly with regard to revenue generation and asset utilization.

Figure 8.1: Hypothesis Testing: Differences According to Ownership Structure



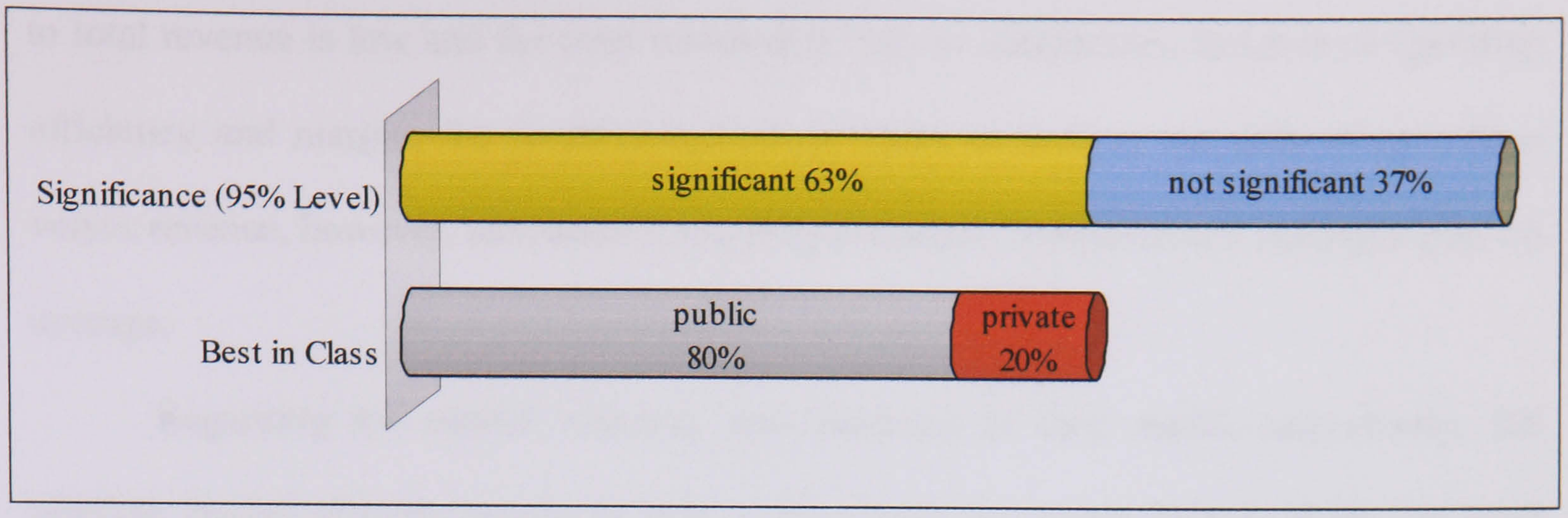

Specifically, the analysis of sample data revealed significant or even highly significant differences between sample airports for more than two thirds of the indicators and ratios measuring operating efficiency (Figure 8.2). In 55% thereof privatised sample airports achieve a higher performance in terms of operating efficiency versus 45% regarding publicly owned ones. Especially in respect of revenue generation represented by inflation-adjusted total and aeronautical revenue per WLU as well as commercial revenue per PAX the latter ones perform better.

Figure 8.2: Hypothesis Testing: Differences in Operating Efficiency



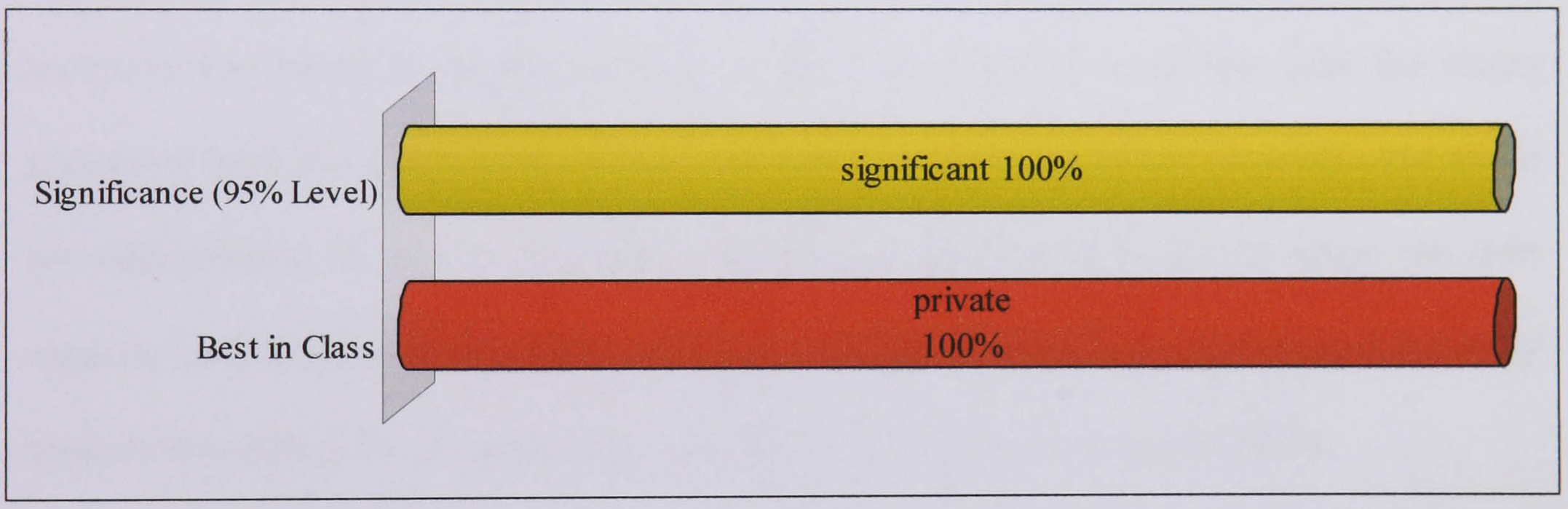

Almost two thirds of the indicators and ratios measuring asset utilization tested significant or even highly significant for a difference between publicly owned and privatised sample airports (Figure 8.3). In 80% thereof publicly owned airports utilize their assets more intensely than privatised ones. This means that the ratio between traffic throughput and capital employed in the business is higher.

Figure 8.3: Hypothesis Testing: Differences in Asset Utilization




The t-tests on differences in the capital structure of publicly owned and privatised airports reveal 100% highly significant results (Figure 8.4). In all cases privatised airports record an 'improved' capital structure in terms of a higher equity share or lower financial leverage than publicly owned sample airports.

Figure 8.4: Hypothesis Testing: Differences in Capital Structure




Furthermore, the analysis of sample data revealed that differences do not only exist between publicly owned and privatised airports, but that the group of privatised airports is not a homogeneous one but that partially and fully privatised companies expose decisive structural differences.

The primary differences between sample airports grouped per ownership status lie in operating efficiency, asset utilization in terms of phased investment and resulting increased traffic throughput or capital productivity and capital structure. Whereas privatised airports are more cost efficient, publicly owned airports generate comparatively

higher total revenue per WLU and higher WLUs to total assets. Their capital expenditure to total revenue is low and the asset turnover is high in comparison. In terms of operating efficiency and margin, the revenue/expenditure ratio, as well as the ratio of cash flow versus revenue, however, the partially and fully privatised companies are ranking higher on average.

Regarding the capital structure and financing of their assets, respectively, the publicly owned airports appear to have a significant advantage. Due to their – at least indirectly – government-backed credit standing they appear to be in a position to assume more debt relatively to their respective equity. This results in considerably higher gearing and financial leverage, compensating for the comparatively low return rate on assets generated by the business.

Financial leverage describes the extent to which a company relies on debt financing rather than equity. It enables an airport to have an asset base larger than its equity and increases the return on equity as long as the cost of liabilities is less than the return generated from investing theses funds. Debt provides a significant tax advantage due to the tax deductibility of interest payments. The use of debt finds its limits where the debt capacity is fully utilized, the credit standing is insufficient and where potential bankruptcy costs tend to offset the advantages to debt (Ross et al 1996; Palepu et al 1997).

The already high gearing level of publicly owned airports may – in turn – also be one of the reasons for airport privatisations. In order to meet the Maastricht criteria under the European Stability Pact, governments cannot afford to put in additional funds in terms of equity to finance necessary capital investment to cope with medium to long-term traffic growth. It is very obvious for all three groups that depreciation cannot finance investment.

The increased operating efficiency of fully privatised airports does not result in higher returns on shareholders' funds. In this respect, the airports in mixed ownership appear to find themselves in an outstanding position, translating into rather competitive

return rates on equity as compared to alternative capital investments. In terms of cost efficiency, revenue generation and financing of their capital structure, they appear to combine the best of both worlds.

With regard to the two hypotheses stated at the outset it was shown that partially and fully privatised airports operate in a more efficient manner, despite the higher revenue-generating abilities of publicly owned (and also partially privatised) ones. Due to the 'disadvantages' of fully privatised airports in terms of financing their capital, they do not appear to be highly attractive from an investor's perspective as clearly opposed to their 'hybrid' relatives. As compared to alternative capital investments, airports in general appear to generate lower return rates on equity, in line with their comparatively conservative risk profile. Nevertheless, they depend on the overall economic development in terms of GDP and external effects affecting the aviation industry as a whole, although they are much more resilient in comparison to airlines, for example.

A comparison of sample airports prior to and after partial or full privatisation confirms the above results in terms of improved financial performance with privatised airports. Operating margin and efficiency as well as equity rise after an increase in the degree of privatisation, while financial leverage, asset utilization and asset turnover decrease. The latter is caused by the comparatively high investment spending.

Although based on the same business model, not all airport earnings are created equally. Functional similarities cover operational and financial differences. A change in ownership brings about structural changes resulting in distinct performance. The return profiles highlight the major characteristics of airports in public, mixed public-private and fully private ownership: The different intensity of the underlying value drivers.

Taking the various findings into due account it can be concluded that partially and fully privatised European commercial airports can be run as profitable companies if they take full advantage of their enormous potential. For the time being, however, only partially

privatised ones may be considered an attractive investment. But they are not necessarily first choice in comparison to alternative investment opportunities, and recent stock performance of the listed companies was not really encouraging. The projected volume growth of air transport, however, which airports will enjoy despite recent events, is a tremendous potential for sustained growth in earnings.

## 8.3 Implications for Investors and Airports

As elaborated on in section 2.2 and summarized in section 8.2 in scholarly terms, several research tools are available to practically assist airport managers and prospective investors in ascertaining the financial performance and enterprise value of an airport and benchmarking it against its peer group as well as other alternative capital investments.

The calculation and analysis of performance indicators and financial ratios provides a comprehensive picture of the variables of the airport value tree and a status of the key value drivers. The outcomes of financial ratio analysis confirm and detail indicators of partial factor productivity at an advanced level. The scores of data envelopment analysis verify both and are validated themselves by regression analysis. Altogether, the results allow to draw conclusions regarding the financial position, its roots, and the attractiveness of a specific airport company as an investment. The analysis of share price performance applies exclusively to partially and fully privatised sample airports; its results give an indication of partial factor productivity, financial ratios and total factor productivity – and vice versa – and are correlated with the overall macroeconomic investment climate.

While grouped FRA and PFP results demonstrate significant or even highly significant differences between publicly owned and privatised sample airports, individual results present a sound decision-making basis for airport management as well as private investors. They may, though, attach different degrees of importance to the various categories. Management can use the outcomes to initiate actions which might enable the

firm to take advantage of its strengths and correct its weaknesses and to help make financing and investment decisions to maximize the company's value in terms of share price and thus market capitalization. Rankings based on DEA scores provide a handy tool to identify the actual position within the sector. The critical consideration for the potential investor, on the other hand, is profitability and market value, with a secondary deliberation given to such matters like liquidity and debt utilization and the ability to meet current and projected financial obligations. DEA league tables of overall performance – based on financial variables – and the price/earnings ratio of the respective shares of stock provide an additional indication of attractiveness.

Table 8.1 summarizes again the methods applied in this study. For the sake of completeness, it also includes regression analysis and t-tests, which are primarily used in the context of academic research.

Table 8.1: Reflection of Methodologies

<table>
<tr><th>Research Methodology</th><th>Relevance of Outputs</th><th>Relations between Results</th><th>Value to Management</th><th>Value to Investors</th></tr>
<tr><td>Partial Factor Productivity</td><td rowspan="4">statistically significant or even highly significant differences between …</td><td>inferential re. basic data (B/S, P&L)</td><td rowspan="5">analytical re. areas for improvement of operating efficiency, financial performance and shareholder value</td><td rowspan="5">informative re. profitability and attractiveness as potential investment (investors likes and dislikes)</td></tr>
<tr><td>Financial Ratio Analysis</td><td>deductive re. basic data and PFP</td></tr>
<tr><td>Data Envelop-ment Analysis</td><td>confirmatory re. basic data, PFP and FRA</td></tr>
<tr><td>Regression Analysis</td><td>concluding re. DEA scores (and ~ RTS)</td></tr>
<tr><td>Share Price Analysis</td><td>[applies only to privatised airports]</td><td>indicative re. PFP, FRA and DEA, correlational re. investment climate</td></tr>
<tr><td>Independent Samples t-Test</td><td rowspan="2">… publicly owned and privatised airports</td><td>conclusive re. PFP and FRA outcomes</td><td rowspan="2">hypotheses testing</td></tr>
<tr><td>Paired-Samples t-Test</td><td>conclusive re. PFP and FRA outcomes</td></tr>
</table>

Thoroughly prepared, performance indicators and financial ratios may be regarded as a reliable basis for judgement about the future development of an organization. In addition, however, the prospective investor should analyse other relevant data, such as

industry trends, technological changes that are anticipated or in process, changes of regional and national economic basic conditions, changes in key management positions within the firm itself, etc., since these external factors drive the value of a company with an immediate impact on the share price.

Controlling the rate of return in order to represent an attractive investment is essential to stimulate the private sector. As derived from this research the key success factors are of vital interest for commercial airports, due to the nature of the business. A combined controlling of these crucial elements may considerably increase earnings, return rates and finally shareholder value.

Airport privatisation means opening up a relatively new investment sector with comparatively stable economics, almost recession-proof and risk-free. Based on the positive projections in traffic development which airports are geared into, they will certainly be more resilient in recessionary periods than airlines. From an investor's point of view, the airport sector is a lower risk way to play the growth prospects of the aviation industry without exposure to the downward pricing pressure that is a feature of the airline industry. This is apparently an investment opportunity for risk averse investors preferably, who are willing to accept somewhat lower returns.

Now that privatisation has been dedogmatized, the importance of maximizing the value of an airport as an asset before seeking external finance has become obvious as well. A clear and sustainable investment case needs to be presented. The private sector demands a steady improvement in operating efficiency and thus productivity, increased profitability and steering a stable course of sustained growth of earnings and ultimately in equity. And this needs to be demonstrated to the investor proactively. Access to private capital is only to be reached at the expense of adherence to commercialism and a focus on profits. And while it is important to enhance the airport company's potential so that its assets can be sold at a price which maximizes the existing strengths of the business, it is equally

important to retain at least some upside potential for the private sector to be attracted (Salomon Brothers 1996).

With regard to an airport company's equity investment in another airport, the question of strategic fit is very likely to be of predominant importance in comparison to potential return rates. Beyond a thorough financial analysis of the respective intended participation, this will also include expected synergies and positive effects on the parent company's value chain in terms of traffic streams and volumes, operations, purchasing and management. But a healthy cost-benefit-relation resulting in an adequate return on investment is essential from the strategic investors' point of view as well (Thompson & Strickland 1996).

In addition to the isolated valuation of the business in question, such issues as the opportunities and political or legal limitations to contribute expertise in core airport processes, to sell services and the freedom to exploit the capability to create and realize value, will have a tremendous impact on the final investment decision. In this respect, the competitive situation of the airport companies in question is decisive. Although quasi-natural monopolies, at least regionally speaking, airports compete in several ways. They compete for airline hub status, O&D traffic as well as transfer passengers, cargo, aircraft service contracts, retail shops and food services and so on (Salomon Brothers 1996; SBC Warburg 1997b).

Airports are heavily dependent on airline strategy and a successful business strategy must complement and build on the strategies of the main customers or the flag carriers and their alliance partners in the case of an international hub, leveraging the opportunities to provide high-value activities such as shopping, lodging and conference facilities, in addition to core airport operational services (Salomon Brothers 1996).

In addition, in the provision of infrastructure airports assume enormous construction and thus financial risk. This makes planning, design and implementation of

capital projects a crucial skill. Management is forced to decide on investment projects with payback periods of 20 years or even more. The achievable returns, however, are materially influenced by regulators with much shorter time horizons and the strategies of the airlines. This, in turn, highlights the necessity of close cooperation with airlines, preferably the particular home carrier, including its respective alliance partners (SBC Warburg 1995, 1996b).

## 8.4 Areas for Further Research

This study has focused on the relations between airport privatisation and financial performance. The results represent an original contribution to the body of knowledge in this field and – if taken into due consideration – also add substantially to the existing framework for objective investment decisions.

Nevertheless, given the limitations of this project, several areas for additional research have been identified. These include those aspects of airport privatisation which had been explicitly excluded in the beginning, such as legal, social and others. Furthermore, service quality issues may be investigated and quantified.

With the increasing number of potential subjects, an additional repeated measures analysis of an expanded matched-sample of airports over an extended period of time after partial or full privatisation may be an area very well worthwhile considering for further research.

Similarly, the slowly growing number of publicly quoted airport companies should result in an appropriate population for a study on the effects of capital expenditure on share price performance.

Another matter of specific interest could be to examine the impact of regulation on yield and to develop a quantitative business model for airports in general as well as for the three ownership types, which is clearly beyond the scope of this study.

# REFERENCES


Abeyratne, R. I. R. (2001). Revenue and investment management of privatized airports and air navigation services – A regulatory perspective. Journal of Air Transport Management, Vol. 7, pp. 217-230.

ABN-AMRO Equities (UK) Ltd., (Ed.). (1998). European airports review. London: ABN AMRO, Airport Sector Research.

ABN-AMRO Equities (UK) Ltd., (Ed.). (2000). Pan-European airports review. London: ABN AMRO, Transport Sector Research.

Adler, N., & Berechman, J. (2000). Measuring airport quality from the airlines' viewpoint: An application of data envelopment analysis. Paper presented at the International Convention of the ATRG 2000, Amsterdam.

Advani, A. (1998). Market orientation – The case of airport privatization. Ph.D. Thesis, University of Oxford. Bodleian D203268.

Airbus Industrie, (Ed.). (1999). Global market forecast 1999. Blagnac Cedex: Airbus Industrie.

Airbus Industrie, (Ed.). (2002). Global market forecast 2001-2020. Blagnac Cedex: Airbus Industrie.

Airbus Industrie, (Ed.). (2003). Global market forecast 2003-2022. Blagnac Cedex: Airbus Industrie.

Airline Business, (Ed.). (2003). The airline industry guide 2003/04. Sutton: Reed Business Information.

Airports Council International, ACI Europe, (Ed.). (1997a). Trends and developments in airport charges 1988-1996. Brussels: ACI-report.

Airports Council International, ACI Europe, (Ed.). (1997b). Policy handbook (2nd ed.). Brussels: ACI.

Airports Council International, ACI, (Ed.). (1998). ACI airport economics survey 1997. Geneva: ACI World Headquarters.

Airports Council International, ACI Europe, (Ed.). (1999). Enquiry into the burden of taxation on ACI Europe member airports. Brussels: ACI/Prisma consulting - report to the 3rd ACI Europe Conference.

Airports Council International, ACI Europe, (Ed.). (2000a). A strategy on environmental restrictions with regard to capacity expansion. Brussels: ACI policy paper.

Airports Council International, ACI Europe, (Ed.). (2000b). ACI Europe comments on the European Commission communication on air transport and the environment towards meeting the challenges of sustainable development. Brussels: ACI policy paper.

Airports Council International, ACI, (Ed.). (2000c). ACI traffic data: World airports ranking by total passengers – 1999 (Final). [Online; 20 December 2000]. Available: http://www.airports.org/traffic/td_passengers_doc.html

Airports Council International, ACI, (Ed.). (2000d). ACI traffic data: World airports ranking by total cargo – 1999 (Final). [Online; 20 December 2000]. Available: http://www.airports.org/traffic/td_cargo_doc.html

Airports Council International, ACI, (Ed.). (2000e). ACI traffic data: World airports ranking by total movements – 1999 (Final). [Online; 20 December 2000]. Available: http://www.airports.org/traffic/td_movements_doc.html

Airports Council International, ACI Europe, (Ed.). (2001a). Airports must have control over their assets. Brussels: Communiqué Airport Business.

Airports Council International, ACI Europe, (Ed.). (2001b). ACI Europe Annual Assembly investigates growth constraints for European airports. Brussels: ACI-press release.

Airports Council International, ACI Europe, (Ed.). (2002). Airport charges in Europe. Brussels: ACI-report.

Airports Council International, ACI Europe, (Ed.). (2003a). Airport charges in Europe. Brussels: ACI-report.

Airports Council International, ACI Europe, (Ed.). (2003b). Growing concern over slots review. Brussels: Communiqué Airport Business.

Airports Council International, ACI Europe, (Ed.). (2003c). ACI Europe guide to finance instruments for European airports. Brussels: ACI-report.

Airports Council International, ACI Europe, (Ed.). (2004). The social and economic impact of airports in Europe. Brussels: ACI/York consulting.

Airports International, (Ed.). (2004, January/February). 2004 – A year of growth. Airports International, p. 12.

Air Transport Research Society, ATRS, (Ed.). (2002). Airport benchmarking report 2002. Vancouver: ATRS.

Air Transport Research Society, ATRS, (Ed.). (2003). Airport benchmarking report 2003. Vancouver: ATRS.

Air Transport World (Ed.). (2001, July). The world airline report. Air Transport World, pp. 48-64.

Air Transport World (Ed.). (2004, January). World airline financial results. Air Transport World, pp. 39-41.

Al-Jazzaf, M. I. (1999). Impact of privatization on airlines performance: An empirical analysis. Journal of Air Transport Management, Vol. 5, pp. 45-52.

Arthur Andersen, (Ed.). (2001). Airport retail study. Sydney: Arthur Andersen Airport Services.

Ashford, N., & Moore, C. A. (1999). Airport finance (2nd ed.). Woodhouse Eaves: The Loughborough Airport Consultancy.

Ashford, N., Stanton, H. P. M., & Moore, C. A. (1997). Airport operations (2nd ed.). New York: McGraw-Hill.

Ashman, S. (2000, March). Competitive strategies for airport commercialisation: The role of non-airline revenue – What the future will bring. Paper presented at IEA's conference Airports 2000, London.

Association of European Airlines, AEA, (Ed.). (2003). Yearbook 2003. Brussels: AEA.

Aviation Strategy, (Ed.). (1998, April). Privatisation: The dawn of a golden age? Aviation Strategy, pp. 1-2.

Aviation Strategy, (Ed.). (1999, January). Airport privatisation – No stopping the juggernaut. Aviation Strategy, pp. 10-13.

Aviation Strategy, (Ed.). (2003, October). Airports: Industry trends and key privatisation issues. Aviation Strategy, pp. 6-10.

Backx, M., Carney, M., & Gedajlovic, E. (2002). Public, private and mixed ownership and the performance of international airlines. Journal of Air Transport Management, Vol. 8, pp. 213-220.

Baker, C. (2001, November). Eurocontrol seeks role in single skies. Airline Business, pp. 23.

Baker, C. (2003, December). Brighter horizons. Airline Business, pp. 54-55.

Barrett, S. D. (2000). Airport competition in the deregulated European aviation market. Journal of Air Transport Management, Vol. 6, pp. 13-27.

Bates, J. (2001, October/November). Small but beautiful. Airport World, pp. 18-26.

Bates, J., & Tyler, C. (2000, October/November). New players enter a crowded field. Airport World, pp. 21-28.

Bazargan, M., & Vasigh, B. (2003). Size versus efficiency: A case study of US commercial airports. Journal of Air Transport Management, Vol. 9, pp. 187-193.

Behnke, P. (2000, August/September). Non-aeronautical revenues and the 'single-till' dilemma. Airport World, p. 1.

Bentley, D. J. (2002). World airport privatisation study: The financing and development of airports at the turn of the 21st century. (2nd ed.). London: Euromoney Institutional Investor PLC & Air Traffic Management.

Black, A., Wright, P., & Bachman, J. E. (1998). In search of shareholder value. London: Financial Times/Pitman Publishing.

Block, S. B., & Hirt, G. A. (1994). Foundations of financial management (7th ed.). Burr Ridge: Irwin.

Boeing, (Ed.). (2000). Current market outlook 2000 – Into the new century. World demand for commercial airplanes and support services. Seattle: Boeing Commercial Airplanes Group.

Boeing, (Ed.). (2001). Current market outlook 2001. World demand for commercial airplanes and support services. Seattle: Boeing Commercial Airplanes Group.

Boeing, (Ed.). (2002). Current market outlook 2002. World demand for commercial airplanes. Seattle: Boeing Commercial Airplanes Group.

Boeing, (Ed.). (2003). Current market outlook 2003. Seattle: Boeing Commercial Airplanes Group.

Borenstein, S. (1997). The evolution of U.S. airline competition. In: Oum, T. H., Dodgson, J. S., Hensher, D. A., Morrison, S. A., Nash, C. A., Small, K. A., & Waters, W. G., (Eds.). Transport economics – Selected readings, pp. 501-538. Amsterdam: Harwood Academic Publishers.

Bureau of Industry Economics, BIE, (Ed.). (1994). International performance indicators aviation. Research Report 59. Canberra: AGPS.

Burghouwt, G., & Hakfoort, J. (2001). The evolution of the European aviation network, 1990-1998. Journal of Air Transport Management, Vol. 7, pp. 311-318.

Butler, G. F., & Keller, M. R. (1995). Airports and airlines: Analysis of a symbiotic, love-hate relationship. In: Jenkins, D., (Ed.). Handbook of airline economics, pp. 87-96. New York: Aviation Week Group/McGraw-Hill.

Butterworth-Hayes, P. (2000, September). New regulations for airports. Jane's Airport Review, pp. 11-12.

Button, K., Lall, S., Stough, R., & Trice, M. (1999). High-technology employment and hub airports. Journal of Air Transport Management, Vol. 5, pp. 53-59.

Button, K., Haynes, K., & Stough, R. (1998). Flying into the future – Air transport policy in the European Union. Cheltenham/Northampton: Edward Elgar.

Campbell, A. (2003/2004, December/January 23-5). Turning a corner: Airlines – will improved economy bring traffic growth for the world's carriers? Flight International, pp. 25-26.

Caves, D. W., Christensen, L. R., & Diewert, W. E. (1982). Multilateral comparisons of output, input, and productivity using superlative index numbers. The Economic Journal, Vol. 92, March, pp. 73-86.

Caves, R. E., & Gosling, G. D. (1999). Strategic airport planning. Oxford: Pergamon.

Centre for Airport Studies, CAS, (Ed.). (1999). Airport retail study. Sydney: CAS.

Centre for the Study of Regulated Industries, CRI, (Ed.). (1999). The UK airports industry – Airports statistics 1998/99. Bath: CRI statistical series.

Centre for the Study of Regulated Industries, CRI, (Ed.). (2001). Regulatory review 2000/2001. Bath: CRI.

Centre for the Study of Regulated Industries, CRI, (Ed.). (2003). Regulatory review 2002/2003. Bath: CRI.

Charnes, A., Cooper, W. W., Lewin, A. Y., & Seiford L. M. (1994). Data envelopment analysis: Theory, methodology, and application (2nd printing 1997). Dordrecht/Norwell: Kluwer Academic Publishers.

Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision-making units. European Journal of Operations Research, Vol. 2, pp. 429-444.

Citrinot, L. (2002, June). Airport spending plummets – Reversing the 1990s trend, passengers are spending less at airports. Jane's Airport Review, p. 7.

Civil Aviation Authority, CAA, (Ed.). (2000). The use of benchmarking in the airport reviews. London: CAA consultation paper.

Coelli, T., Prasada Rao, D. S., & Battese G. E. (1998). An introduction to efficiency and productivity analysis (5th printing 2001). Dordrecht/Norwell: Kluwer Academic Publishers.

Colella, M. (1998). Global airport privatisation trends. The Transport Economist, Vol. 25, pp. 1-13.

Commerzbank AG, (Ed.). (2001a). Airline alliances. London: Commerzbank AG, Securities.

Commerzbank AG, (Ed.). (2001b) Airline outlook now: Fundamentally and irrevocably changed. London: Commerzbank AG, Securities.

Cooper, W. W., Seiford, L. M., & Tone, K. (2000). Data envelopment analysis – A comprehensive text with models, applications, references and DEA-Solver software (2nd printing 2000). Dordrecht/Norwell: Kluwer Academic Publishers.

Copeland, T., Koller, T., & Murrin, J. (1996). Valuation: Measuring and managing the value of companies. (2nd ed.). New York: John Wiley & Sons.

Cranfield University, Department of Air Transport, College of Aeronautics, (Ed.). (1996). Competition and airport financing in the EU. Cranfield: University.

Credit Suisse First Boston, CSFB, (Ed.) (2001). European transport: Implications of shocking terrorist attack. London/Zurich: CSFB, Equity Research.

Damodaran, A. (1996). Investment valuation: Tools and techniques for determining the value of any asset. New York: John Wiley & Sons.

Dempsey, P. S. (2000). Airport planning & development handbook – A global survey. New York: McGraw-Hill.

De Neufville, R., & Odoni, A. (2003). Airport systems: Planning, design, and management. New York: McGraw-Hill.

Dennis, N. (1999). The impact of airline industry changes on airports. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Dennis, N. (2000). Scheduling issues and network strategies for international airline alliances. Journal of Air Transport Management, Vol. 6, pp. 75-85.

Dennis, N. (2001). Airports for the future – Developments of hubbing at European airports. Air & Space Europe, Vol. 3, pp. 51-55.

Deutsche Bank AG, (Ed.). (1999). European airports – Privatisation ahead. London: Deutsche Bank AG, European Equity Research.

Deutsche Bank AG, (Ed.). (2000). Airports: Dawn of a new era. London: Deutsche Bank AG, European Equity Research.

De Wit, J., Uittenbogaart, P., & Wei-Yun, T. (1999). Hubbing and hub-bypassing: Network developments in a deregulated European airport system. Paper presented at the International Convention of the ATRG 1999, Hong Kong.

Doganis, R. (1992). The airport business (reprinted 1996). London/New York: Routledge.

Doganis, R. (1997). Airport alliances & globalisation. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Doganis, R. (1999). The impact of globalisation and transnational airline alliances on the airport industry. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Doganis, R. (2001). The airline business in the 21st century. London/New York: Routledge.

Doganis, R., & Graham, A. (1987). Airport management: The role of performance indicators. Transport Studies Group, Research Report No. 13. London: Polytechnic of Central London.

Doganis, R., Lobbenberg, A., & Graham, A. (1994). A comparative study of value for money at Australian and European airports. Department of Air Transport, College of Aeronautics, Cranfield University & Transport Studies Group, University of Westminster. Cranfield: University.

Doganis, R., Lobbenberg, A., & Graham, A. (1995). The economic performance of European airports. Research Report No 3., Department of Air Transport, College of Aeronautics, Cranfield University & Transport Studies Group, University of Westminster. Cranfield: University.

Doganis, R., & Nuutinen, H. (1983). Economics of European airports. Transport Studies Group, Research Report No. 9. London: Polytechnic of Central London.

Donald, C. (1996, July/August). Private thoughts. Airport Business Management & Development, pp. 51-52.

Donoghue, J. A. (2004, January). Recovery 2004: Gaining strength. Air Transport World, pp.28-34.

Dresdner Kleinwort Wasserstein, DrKW, (Ed.). (2003). Transport valuation weekly. London: DrKW Securities Ltd.

Dresdner Kleinwort Wasserstein, DrKW, (Ed.). (2004). Trends in transport: Airports. London: DrKW Securities Ltd.

Elton, E. J., & Gruber, M. J. (1995). Modern portfolio therory and investment analysis (5th ed.). New York: John Wiley & Sons.

Endres, G., & Yates, C. (1998, September). Regionals increase market share. Jane's Airport Review, pp. 14-21.

Favotto, I. (1998/1999, December/January). Not all airports are created equal. Airport World, pp. 22-23.

Feldman, D. (1996, December). Commercial magnetism. Airline Business, pp. 36-39.

Feldman, J. M. (1997, May). Airports for sale. Air Transport World, pp. 69-72.

Feldman, J. M. (1999, March). What year of aviation. Air Transport World, pp. 45-48.

Feldman, J. M. (2002, August). No more hiding places. Air Transport World, pp. 27-28.

Field, A. (2000). Discovering statistics using SPSS for Windows (reprinted 2002). London/Thousand Oaks: SAGE Publications.

Field, D. (2001, September 18-24). Airlines to be long-term victims as terrorism shock waves hit industry. Flight International, pp. 6-7.

Field, D., & Pilling, M. (2003, July). IATA demands cost saving action. Airline Business, p. 11.

Francis, G., Humphreys, I., & Fry, J. (2002). The benchmarking of airport performance. Journal of Air Transport Management, Vol. 8, pp. 239-247.

Freathy, P., & O'Connell, F. (1998). European airport retailing. London: Macmillan.

Freud, D. (1995, October). Clarifying the factors to consider when evaluating alternative finance structures and determining which is most appropriate for your airport. Paper presented at ICBI's 2nd Annual Airport Development Forum, Amsterdam.

Gangl, S. (1999). The globalisation of airport companies. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Gangl, S. (2002). The globalisation of airport companies. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Garrison, R. H., & Noreen, E. W. (1994). Managerial accounting (7th ed.). Burr Ridge: Irwin.

George, A. (2000, October 3-9). EU slot proposals alarm airlines. Flight International, p. 27.

Gethin, S. (2001, September). Twist in the tale for Pantares. Jane's Airport Review, p. 15.

Gill, T. (1998, December). Near to the limit. Airline Business, p. 46.

Gill, T., & O'Toole, K. (1998, December). Airports gearing up to grow. Airline Business, pp. 44-46.

Gillen, D., & Cooper, D. (1994). Measuring airport efficiency and effectiveness in the California aviation system. Research report UCB-ITS-RR-94-17. Institute for Transportation Studies, University of California Berkeley.

Gillen, D., & Lall, A. (1997). Developing measures of airport productivity and performance: An application of data envelope analysis. Proceedings of the 1997 Air Transport Research Group Conference of the WCTR Society, Vancouver.

Gillen, D., & Lall, A. (1998). Non-parametric measures of efficiency of U.S. airports. Proceedings of the 1998 Air Transport Research Group Symposium of the WCTR Society, Dublin.

Gómez-Ibánez, J. A., & Meyer, J. R. (1993). Going private. The international experience with transport privatization. Washington, D.C.: The Brookings Institution.

Graham, A. (1996a). Measuring economic performance. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (1996b). The US experience. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (1997). Airport economics and performance measurement. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (1998). Airport economics and performance measurement. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (1999a). Benchmarking airport economic performance. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (1999b). The US experience. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (2001). Performance measures and benchmarking in the airport industry. Paper presented at the Airport Economics and Finance Symposium, University of Westminster/Cranfield University.

Graham, A. (2003). Managing airports – An international perspective (2nd ed.). Oxford: Butterworth-Heinemann.

Graham, A., & Dennis, N. (1993, September 1-3). Factors affecting airport performance. Paper presented at the Regional Science Association International British Section, 24th Annual Conference, London.

Graham, A., & Holvad, T. (1997). Measurement of efficiency for European & Australian airports. Paper presented at the EURO XV/INFORMS Joint International Conference, Barcelona.

Greenwood, D. (1996, October). Clarifying EU aims and objectives for airport development and member state regulation. Paper presented at ICBI's 3rd Annual Airport Development Forum, Berlin.

Hagstrom, R. G. (1995). The Warren Buffet way (2nd ed.). New York: John Wiley & Sons.

Hazel, R. (1995). Airport economics. In: Jenkins, D., (Ed.). Handbook of airline economics, pp. 113-119. New York: Aviation Week Group/McGraw-Hill.

Hensher, D. A. (1991). Total factor productivity growth and endogenous demand: Establishing a benchmark index for the selection of operational performance measures in public bus firms. Institute of Transport Studies working paper ITS-WP-91-7. Sydney: University.

Hensher, D. A., & Waters, W. G. (1993). Using total factor productivity and data envelopment analysis for performance comparisons among government enterprise: Concepts and issues. Institute of Transport Studies working paper ITS-WP-93-10. Sydney: University.

Hooper, P. G. (1987). Productivity change in transport: A survey. Transport Reviews, Vol. 7, pp. 341-367.

Hooper, P. G., & Hensher, D. A. (1998). Measuring total factor productivity of airports – An index number approach. Institute of Transport Studies working paper ITS-WP-98-2. Sydney/Monash: University.

Horonjeff, R., & McKelvey, F. X. (1994). Planning & design of airports (4th ed.). New York: McGraw-Hill.

Humphreys, I. (1999). Privatisation and commercialisation – Changes in UK airport ownership patterns. Journal of Transport Geography, Vol. 7, pp. 121-134.

Humphreys, I. (2003). Organizational and growth trends in air transport. In: Upham, P., Maughan, J., Raper, D., & Thomas, C., (Eds.). Towards sustainable aviation, pp. 19-35. London: Earthscan Publications.

Humphreys, I., & Francis, G. (2000). Traditional airport performance indicators – A critical perspective. Transportation research Record, No. 1703, pp. 24-30.

HypoVereinsbank, HVB, (Ed.). (2002). Airports: Everything remains different! Focus on changes in the environment for airport operators. Munich/London: HVB Corporate & Markets, Equity Research.

International Air Transport Association, IATA, (Ed.). (2003). Annual report 2003. Geneva/Montreal: IATA.

International Civil Aviation Organisation, ICAO, (Ed.). (1991). Airport economics manual. Montreal: ICAO Doc 9562.

International Civil Aviation Organisation, ICAO, (Ed.). (2000). Financial situation of airports and air navigation services. Montreal: ICAO ANSConf working paper No. 3.

Ionides, N., Rayko, R., & Wastnage, J. (2001, September 18-24). Future Tense. Flight International, pp. 44-51.

Jane's Airport Review, (Ed.). (1999, April). European growth under pressure. Jane's Airport Review, p. 4.

Jane's Airport Review, (Ed.). (2003, April). Investors ride the storm. Jane's Airport Review, pp. 6-7.

Jasper, C. (2001, May 8-14). Set for slowdown. Flight International, pp. 42-43.

Jessop, A. (1999, November). A multiattribute assessment of airport performance. Paper presented at the 25th Euro working group on financial modelling of the Institute für Finanzierung und Finanzmärkte, Vienna.

Jessop, A. (2000). Two views on airport performance. Mimeo, Durham University Business School.

Kaplan, R. S., & Norton, D. P. (1996). The balanced scorecard: Translating strategy into action. Boston: Harvard Business School Press.

Kaps, R. W. (2000). Fiscal aspects of aviation management. Carbondale: Southern Illinois University Press.

Kapur, A. (1995, November). Overview of airport privatization efforts. Paper presented at the 1995 ACI Airport Financial Management Seminar, Aruba.

Kapur, A. (1996). Airport infrastructure: The emerging role of the private sector. Washington, D.C.: The World Bank.

Kapur, A. (1997, February). Airport privatization: What are the options? Paper presented at the 1997 ACI Airport Financial Management Seminar, Hurghada.

Kazda, A., & Caves, R. E. (2000). Airport design and operation. Oxford: Pergamon.

Kurland, S. (1998, December). US airports have been slow to adopt a private ownership structure. Jane's Airport Review, p. 26.

Lawton, T. C. (2002). Cleared for take-off – Structure and strategy in the low fare airline business. Aldershot: Ashgate Publishing.

Learmount, D. (2000, September 19-25). Privatisation the answer to ATC difficulties, says IATA. Flight International, p. 12.

Learmount, D. (2003, December 16-22). Europe gives Single Sky go-ahead. Flight International, p. 4.

Lemaître, A. (1997). Airport performance measurement: Review of methods and studies for measuring economic efficiency and productivity or the policy maker's perspective. Proceedings of the 1997 Air Transport Research Group conference of the WCTR Society, Vancouver.

Lemaître, A. (1998). The development of performance indicators for airports: A management perspective. Proceedings of the 1998 World Conference on Transport Research, Antwerp.

LeTourneur, C. (2001/2002, December/January). The bricks and mortar of global commerce. Airport World, pp. 36-40.

Mackenzie-Williams, P. (1998, September). Airports aim for peak performance. Airports International, pp. 38-40.

Martín, J. C., & Román, C. (2001). An application of DEA to measure the efficiency of Spanish airports prior to privatization. Journal of Air Transport Management, Vol. 7, pp. 149-157.

Martín, S., & Parker, D. (1997). The impact of privatisation – Ownership and corporate performance in the UK. London/New York: Routledge.

McCormick, C. (2000, September). US privatisation program to expand? Airports International, p. 9.

Mercer Management Consulting, (Ed.). (1997). Global airport management: Strategic challenges in an emerging industry. London/Munich/Paris: Mercer.

Monopolies and Mergers Commission and CAA, (Eds.). (1991). BAA plc: A report on the economic regulation of the South-East airport companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd). London: HMSO.

Moody's Public Finance Department, (Ed.). (1992). Moody's on airports: The fundamentals of airport debt. New York: Moody's Investors Service.

Morgan Stanley, (Ed.). (2003). Fraport. London: Morgan Stanley Transportation/ Equity Research Europe.

Morgan Stanley Dean Witter, MSDW, (Ed.). (2000). Airports: Flocking to the super-hubs. London: MSDW Transportation/Equity Research Europe.

Mountford, T. (2001, December). Global airport groupings. Airline Business, pp. 43-44.

Mountford, T., & McNamee, L. (2003, December). Global airport groupings. Airline Business, pp. 57-58.

Moxon, J. (1997, April 9-15). Euro liberalisation could still cause problems. Flight International, p. 10.

Moxon, J. (2003, November 18-24). Single European Sky draws near. Flight International, p. 16.

Murillo-Melchor, C. (1999). An analysis of technical efficiency and productivity changes in Spanish airports using the Malmquist Index. International Journal of Transport Economics, Vol. XXVI, pp. 271-292.

National Economic Research Associates, NERA, (Ed.). (1998). Developing best practices for promoting private sector investment in infrastructure: Airports and air traffic control. London: NERA.

National Economic Research Associates, NERA, (Ed.). (2001). The application of benchmarking to airports phase 1: Data collection and assessment. A final report for the Civil Aviation Authority. London: NERA.

Nelms, D. W. (1999, April). Getting their acts together. Air Transport World, pp. 26-36.

Norusis, M. J. (1996). SPSS 6.1 guide to data analysis. Englewood Cliffs: Prentice Hall.

O'Connor, A. (2002, May). Cross equity deals win support. Jane's Airport Review, pp. 8-10.

O'Connor, G. (1996). A guide to stockpicking. London: Random House.

Organization for Economic Co-Operation and Development, OECD, (Ed.). (1997). The future of international air transport policy – Responding to global change. Paris: OECD.

Organization for Economic Co-Operation and Development, OECD, (Ed.). (1998). Corporate governance, state-owned enterprises and privatisation. Paris: OECD.

O'Toole, K. (1999, January). Global outlook – Airlines prepare for the worst. Airline Business, p. 45.

O'Toole, K. (2002, July). Cost equation. Airline Business, pp. 42-44.

Oum, T. H., Tretheway, M. W., & Waters, W. G. (1992). Concepts, methods and purposes of productivity measurement in transportation. Transportation Research, Vol. 26A, pp. 493-505.

Oum, T. H., & Yu, C. (1998). Winning airlines: Productivity and cost competitiveness of the world's major airlines (2nd printing 1999). Dordrecht/Norwell: Kluwer Academic Publishers.

Palepu, K., Bernard, V., & Healy, P. (1997). Introduction to business analysis & valuation. Cincinnati: South-Western Publishing Co./International Thomson Publishing.

Parker, D. (1999). The performance of BAA before and after privatisation: A DEA study. Journal of Transport Economics and Policy, Vol. 33, Part 2, pp. 133-146.

Pels, E. (2000). Airport economics and policy – Efficiency, competition, and interaction with airlines. Ph.D. Thesis, Vrije Universiteit, Amsterdam. Tinbergen Institute Research Series No 222.

Pels, E., Nijkamp, P., & Rietveld, P. (2001). Relative efficiency of European airports. Transport Policy, Vol. 8, pp. 183-192.

Pfähler, W., Niemeier, H.-M., & Mayer, O. G. (Eds.). (1999). Airports and air traffic regulation, privatisation and competition. Frankfurt/Berlin: Peter Lang.

Pike, R., & Neale, B. (1996). Corporate finance & investment – Decisions and strategies (2nd ed.). Hemel Hempstead: Prentice Hall Europe.

Pilling, M. (2002, June). Making the grade. Airline Business, pp. 70-72.

Pilling, M. (2003, December). Terms of engagement. Airline Business, pp. 46-48.

Pilling, M. (2004, January). ACI strikes back at IATA. Airline Business, p. 8.

Pilling, M. & Baker, C. (2004, February). Bright outlook in 2004. Airline Business, p. 9.

Pinkham, R. (2002, July). Global gameplans. Airline Business, pp. 48-49.

Pino, M., & Fischbeck, B. (1995). Airport funding. In: Jenkins, D., (Ed.). Handbook of airline economics, pp. 107-112. New York: Aviation Week Group/McGraw-Hill.

Price, L. (1998). The crisis in airport capacity. Paper presented at the Demand Analysis and Capacity Management Seminar, University of Westminster.

Prices Surveillance Authority, PSA, (Ed.). (1993). Inquiry into the aeronautical and non-aeronautical charges of the Federal Airports Corporation. Australia: PSA.

Rappaport, A. (1998). Creating shareholder value (2nd ed.). New York/London: The Free Press.

Reynolds-Feighan, A. J., & Button, K. J. (1999). An assessment of the capacity and congestion levels at European airports. Journal of Air Transport Management, Vol. 5, pp. 113-134.

Rolls-Royce, (Ed.). (2001). The outlook 2001-2020. Derby: Rolls-Royce plc.

Ross, S. A., Westerfield, R. W., & Jaffe, J. (1996). Corporate finance (4th ed.). Chicago/London/Sydney/Toronto: Irwin.

Rozario, K. (2001, July/August). Duty-free fall arrested – Airports are recovering from the loss of duty-free. Jane's Airport Review, pp. 10-13.

Ryland, P. (2000). The Economist pocket investor: The world of investment from A to Z (3rd ed.). London: Profile Books Ltd/The Economist Newspaper Ltd.

Salazar de la Cruz, F. (1999). A DEA approach to the airport production function. International Journal of Transport Economics, Vol. XXVI, pp. 255-270.

Salomon Brothers Inc., (Ed.) (1996). European airports: Destination private sector – Cleared for take-off. London/New York: Salomon Brothers Inc., European Equity Research.

Sarkis, J. (2000). An analysis of the operational efficiency of major airports in the United States. Journal of Operations Management, Vol. 18, pp. 335-351.

SBC Warburg, (Ed.). (1995). European airports. London: Swiss Bank Corporation, SBC Warburg.

SBC Warburg, (Ed.). (1996a). SBC Warburg's European Transport Conference 1996. London: Swiss Bank Corporation, SBC Warburg.

SBC Warburg, (Ed.). (1996b). European airports '96. London: Swiss Bank Corporation, SBC Warburg.

SBC Warburg, (Ed.). (1997a). European airports 1997. London: Swiss Bank Corporation, SBC Warburg Dillon Read.

SBC Warburg, (Ed.). (1997b). Global transport review. London: Swiss Bank Corporation, SBC Warburg.

Schroder Salomon Smith Barney, SSSB, (Ed.) (2002). Industry report: Airports. London: SSSB, European Equity Research.

Sengupta, J. K. (1995). Dynamics of data envelopment analysis. Dordrecht/ Norwell: Kluwer Academic Publishers.

Shank, J. K., & Govindarajan, V. (1993). Strategic cost management. New York/London: The Free Press.

Sharpe, M., Birtles, P., & Duke, G. (2001). Airport – Behind the scenes of commercial aviation. San Diego: Thunder Bay Press/Advantage Publishers Group.

Skapinker, M. (1998, September 3). Private sector transforms problems into profits – FT survey on aerospace. Supplement to the Financial Times, p. IX.

Soeda, S. (1999, December). Global comparison of airport management. Greek Port Report, pp. 2-7.

Sowter, R. (2000, February). Airports snap up opportunities overseas. Jane's Airport Review, p. 11.

Standard & Poor's, S&P, (Ed.). (2002). European airport review. London: S&P Infrastructure Finance.

Standard & Poor's, S&P, (Ed.). (2003). European airport review. London: S&P Infrastructure Finance.

Stanmeyer, C., & Cote, L. (1995). Airport finance. In: Jenkins, D., (Ed.). Handbook of airline economics, pp. 97-106. New York: Aviation Week Group/McGraw-Hill.

Starkie, D. (2002). Airport regulation and competition. Journal of Air Transport Management, Vol. 8, pp. 63-72.

Symonds Travers Morgan Ltd., STM, (Ed.). (1996). Review of airport charges 1996. London: STM.

Symonds Travers Morgan Ltd., STM, (Ed.). (1997). Review of airport performance 1997. London: STM.

Symonds Travers Morgan Ltd., STM, (Ed.). (1998). Review of airport performance 1998. London: STM.

Teitelbaum, R. (1996, April 29). What's driving return on equity. Fortune Magazine, pp. 165-168.

Thanassoulis, E. (2001). Introduction to the theory and application of data envelopment analysis – A foundation text with integrated software. Dordrecht/Norwell: Kluwer Academic Publishers.

Thompson, A. A. & Strickland, A. J. (1996). Strategic management (9th ed.). London: Irwin.

Tolofari, S. R., Ashford, N., & Caves, R. E. (1990). The cost of air service fragmentation. Department of Transport Technology, Report TT9010. Loughborough: University of Technology.

Transport Research Laboratory, TRL, (Ed.). (1999). Airport performance indicators. London: TRL.

Transport Research Laboratory, TRL, (Ed.). (2000). Airport performance indicators. London: TRL.

Transport Research Laboratory, TRL, (Ed.). (2001). Airport performance indicators. London: TRL.

Transport Research Laboratory, TRL, (Ed.). (2002). Airport performance indicators. London: TRL.

Union Bank of Switzerland Group, UBS, (Ed.). (1996). European airports. London/Zurich: Union Bank of Switzerland Group, UBS Global Research.

Union Bank of Switzerland Group, UBS, (Ed.). (1997). Austrian equities: Vienna airport. London/Zurich: Union Bank of Switzerland Group, UBS Global Research.

Van Horne, J. C. (1998). Financial management and policy (11th ed.). Englewood Cliffs: Prentice Hall International.

Vasigh, B., & Hamzaee, R. G. (2000). Airport efficiency: An empirical analysis of the U.S. commercial airports. Paper presented at the International Convention of the ATRG 2000, Amsterdam.

Vickers, J., & Yarrow, G. (1988). Privatization. An economic analysis (reprinted 1995). Cambridge, Mass.: The MIT Press.

Ward, C. (1998, November). Shopping for airport profit. Jane's Airport Review, p. 19.

Waters, W. G. (1998). The link between TFP prices and financial performance: Applications to air and rail transportation. Proceedings of the 1998 World Conference on Transport Research, Antwerp.

Watson, A., & Beeby, H. (2002, June). Money matters. Passenger Terminal World, pp. 66-70.

Wells, A. T. (1996). Airport planning & management (3rd ed.). New York: McGraw-Hill.

Weston, F., Besley, S., & Brigham, E. (1996). Essentials of managerial finance (11th ed.). Orlando: The Dryden Press.

White, P. R. (2002). Public transport: Its planning, management and operation (4th ed.). London: Spon Press.

# APPENDICES

## Appendix A.1: Operational Performance Indicators

Table A.1.1: Passenger Processing Performance Indicators

| Author | Performance Indicators |
|---|---|
| Fruin<br>(1971) | • Ease of flow<br>- Freedom of movement |
| Brink and Madison<br>(1975) | • Passenger walking distance<br>- Processing time<br>- Congestion<br>- Waiting time<br>- Occupancy parameter (crowding) |
| Passenger terminal building design manual AK – 62 – 10<br>(1978) | • Operational effectiveness<br>- Safety and security<br>- Comfort<br>- Convenience<br>- Flow of traffic<br>- Delays<br>• Flexibility<br>- Change/growth<br>• Economy<br>- Cost and revenue<br>- Benefit balance<br>• Passenger convenience/comfort<br>- Travel time<br>- Walking distance<br>- Accessibility to amenities<br>- Service convenience<br>- Clarity signage<br>- Passenger opportunity for communications about orientation and information |
| Modak and Patkar<br>(1984) | • Passenger orientation |
| Ashford<br>(1990) | • For passenger activity<br>- Processing time<br>- Queuing time<br>- Time spend in queue<br>• For holding areas<br>- Space<br>- Time |
| IATA<br>(1990) | • Prime criteria for evaluating the level of service<br>- Space available to occupants<br>- Time<br>• Additional criteria<br>- Comfort<br>- Convenience<br>- Distance |

Table A.1.1: Passenger Processing Performance Indicators (cont'd)

| Author | Performance Indicators |
|---|---|
| IATA (cont'd)<br>(1990) | • Factors affecting space required in relation to occupancy/time<br>- Passenger behaviour patterns<br>- Psychological requirements<br>- Passenger comfort |
| Odoni & de Neufville<br>(1990) | • Passenger dwell time within the terminal |
| Lemer TRB 1199<br>(1990) | • Waiting time<br>• Processing time<br>• Crowding<br>• Amenities for comfort and convenience<br>• Delays |

Source: Lemaître 1998

Table A.1.2: Performance Indicators for Ground Access Facilities Service Levels

| Author | Performance Indicators |
|---|---|
| IATA<br>(1990) | • Parking lots<br>- Availability of parking spaces (probability of a space being available, related to the demand for space)<br>- Flow/capacity ratio<br>- Accessibility<br>• Curbs<br>- Probability of finding a curb stall given the number of stalls<br>- Dynamic flow<br>- Volume of demand<br>• Roadways<br>- Traffic volume<br>- Vehicle speed<br>- Roadway design |

Source: Lemaître 1998

## Appendix A.2: Marketing Performance Indicators

Table A.2.1: Measuring Passenger Satisfaction in the Terminal Area

| Method | Author | Performance Indicators |
|---|---|---|
| • Perception response model | Mumayiz and Ashford (1986) | • Time spend in various processors |
| • Framework based on psychological theories of perceptual scaling and categorical judgement<br>• Passenger survey at San-Francisco International Airport | Muller and Gosling (1991)<br>Muller (1987) | • Waiting time<br>• Crowding |
| • Attitudinal passenger surveys. Empirical study conducted on Dorval Airport PTB Montréal | Martel and Seneviratne (1990) | • Information<br>• Waiting time for processing activities<br>• Availability of seats<br>• Concessions (i.e. variety and accessibility)<br>• Internal environment (i.e. aesthetics and climate) |
| • Derive quantitatively target threshold values for passenger perception of service based on attitudinal surveys conducted at airports at regular intervals<br>• Measure quality of service at processing facilities of airport terminals based on user's perception and evaluation of service | Mumayiz (1991) | • Delays<br>• Queues<br>• Crowding<br>• Congestion |
| • Modelling the linguistic variables provided by the users via fuzzy sets and linguistic value computation | Ndoh and Ashford (1993) | • At holding facilities<br>- Crowding<br>- Comfort<br>- Visual interest<br>- Waiting time<br>• At circulatory facilities<br>- Walking distance<br>- Directness<br>- Signing<br>- Ease of transiting |

Table A.2.1: Measuring Passenger Satisfaction in the Terminal Area (cont'd)

| Method | Author | Performance Indicators |
|---|---|---|
| • Obtain by survey a user-perceived level of service<br>• Methods and measures to be used to evaluate the level of an airport according to the type of passenger's activity<br>• Design of transport facilities<br>• Examples of passenger service standards BAA – IATA – Schiphol airport | Ashford (1990) | • Performance indicators vary according to the type of passenger's activity<br>- Processing<br>- Holding<br>- Circulation<br>• Techniques for evaluating level of service<br>- Queuing<br>(a) space provided<br>(b) time spend in queue<br>- Holding<br>a) space<br>b) time<br>• Area per person available at that facility at a given time |
| -- | U.S. Department of Transport – Office of Consumer Affairs – Air Travel Consumer Report – (1990) | • Flight delays<br>• Mishandled baggage<br>• Oversales<br>• Consumer complaints |
| • Theoretical model based on utility theory<br>• Model has not been implemented<br>• Development of an utility-theoretics methodology for quantifying level of service by taking into account the time and space standards | Omar and Kahn (1990)<br>Kahn (1992) | • Existence of a relationship between space/service standards, user perceived value on utility of level of service and cost<br>• Trade-offs between the value of the indicators related to level of service and the value of the indicators related to costs |
| • Performance indicators defined according to the stakeholders conflicting interests<br>• Passengers<br>• Airport operators<br>• Airline viewpoint<br>• Concessionaires<br>• Local government<br>• Federal government | Lemer (1990, 1992) | • For Passengers<br>- compactness (walking distance, level changes)<br>- delay and waiting times<br>- service reliability (convenience costs) |

Source: Lemaître 1998

Table A.2.2: Measuring Passenger Perception of Airport Access

| Method | Author | Performance Indicators |
|---|---|---|
| • Psychometric techniques (psychometric mathematical models for analysing categorical data rooted in the law of comparative judgement<br>• Method applied to a case study of access at London Airport | Ndoh and Ashford (1993) | • Mode availability<br>• Airport distance<br>• Various components of journey time (waiting, processing, access to mode, mode transfer, in-vehicle)<br>• Level of convenience and comfort (ease of use and luggage handling, number of terminal and vehicle transfers, parking availability)<br>• Mode reliability to ensure on time performance |

Source: Lemaître 1998

## Appendix A.3: Financial and Economic Performance Indicators

Table A.3.1: Financial Indicators

| Strategic Indicators | Tactical Indicators |
|---|---|
| • Return on capital investment<br>• Pay back period<br>• Self financing ratio<br>• Current assets/liabilities<br>• Debtors ratio<br>• Creditors ratio | • Income per passenger or WLU<br>• Cost per passenger or WLU<br>• Income per unit or facility or throughput (i.e. income per square meter or square foot, income per available parking space)<br>• Cost per unit of facility or throughput<br>• Gross profit on sales<br>• Rate of return on sales<br>• Percentage of concessionary sales<br>• Overtime hours/normal hours ratio |
| **Day-to-day Indicators** | **Target Indicators** |
| • Cash flows<br>• Revenue flows<br>• Expenditure flows<br>• Actual and budgeted revenues and expenditures<br>• Outstanding debtors and location of debt<br>• Outstanding creditors and location of credit | • Return on capital<br>• Cost improvements<br>• Productivity improvements<br>• Level of service criteria (i.e. equipment availability, complaints and compliments) |

Source: Ashford & Moore 1999

Table A.3.2: Financial and Economic Performance Indicators (ICAO)

| Financial and Economic Performance Indicators | |
|---|---|
| • Income per passenger<br>• Expenditure per passenger<br>• Trading profit per passenger<br>• Aeronautical income per passenger<br>• Non-aeronautical income per passenger | • Passengers per employee<br>• Income per employee<br>• Value added per employee<br>• Capital expenditure per passenger<br>• Net assets per employee |

Source: ICAO 1991

Table A.3.3: Financial and Economic Performance Indicators (Moody's)

| **Financial and Economic Performance Indicator** | |
|---|---|
| • Revenue per enplaned passenger<br>• Operating ratio<br>• Net take-down<br>• Debt per enplaned passenger<br>• Debt service safety margin | • Debt ratio<br>• Debt service coverage<br>• Aircraft parking fees/1,000 lb.<br>• Passenger terminal rent/acre/year |

Source: Moody's 1992

Table A.3.4: Financial Performance Indicators

| **Financial Performance Indicators** | |
|---|---|
| Operating ratio | $\frac{\text{Operating expenses}}{\text{Operating revenues}}$ |
| Net take-down ratio | $\frac{\text{Gross revenues} - \text{Operating/maintenance expenses}}{\text{Gross revenues}}$ |
| Debt-to-assets (or equity) ratio | $\frac{\text{Gross debt} - \text{Bond principal reserves}}{\text{Net fixed assets} + \text{Working capital}}$ |
| Debt service safety margin | $\frac{\text{Gross revenues} - \text{Operating/maintenance expen.} - \text{Annual debt services}}{\text{Gross revenues}}$ |

Source: Caves & Gosling 1999

## Appendix B.1: Airport Specifics

## ABZ – Aberdeen, UK

<table>
<tr><td>Period Covered</td><td colspan="3">1 April 1990 – 31 March 2000</td></tr>
<tr><td rowspan="6">Airport Size</td><td></td><td>Total<br>1999/2000</td><td>Growth<br>1990/91 – 1999/00</td></tr>
<tr><td>Aircraft Movements</td><td>101,200</td><td>-13%</td></tr>
<tr><td>Terminal PAX ('000)<br>• Scheduled<br>• International</td><td>2,444<br>75%<br>19%</td><td>24%<br>35%<br>150%</td></tr>
<tr><td>Air Cargo (in tonnes)<br>• Air Freight<br>• Air Mail</td><td>6,006<br>77%<br>23%</td><td>-26%<br>-27%<br>-22%</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Runways and Passenger Facilities</td><td colspan="3">• 4 runways (main runway 1,829 m, two runways are used by helicopters only).<br>• 5 passenger terminals (main terminal, three terminals dedicated to North Sea helicopter operations and one terminal primarily for oil company charter flights).</td></tr>
<tr><td>Nature of Traffic</td><td colspan="3">The airport was one of the world's most active bases for helicopters engaged in oil support work. However, in the mid-1980s a decline in the offshore gas and oil industry became apparent, which in turn brought about a reduction in the number of charter operators.<br>PAX: Mainly scheduled domestic traffic (61%).<br>Cargo: Freight and mail are declining since 1998.</td></tr>
<tr><td colspan="4">Accounting Principles/Policies and Accounting Specifics<br>• 1997/98 P&L includes extraordinary expense for windfall taxes.<br>• On 31 July 1986, the main airport assets were transferred from the British Airports Authority (BAA).</td></tr>
<tr><td colspan="4">Ownership and Regulation<br>Owned by BAA plc, whose stock is privately owned since 1987.<br>BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the respective RPI-X price caps.</td></tr>
<tr><td colspan="4">Major Investments in Fixed Assets: n/a</td></tr>
<tr><td colspan="4">Major Financial Investments and Participations: n/a</td></tr>
<tr><td colspan="4">Extraordinary Events and Others Factors: n/a</td></tr>
</table>

## ADP – Aeroports de Paris Group, France

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| **Roissy-Charles-de Gaulle (CDG)**<br><br>Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 475,731 | 102% |
| | **Terminal PAX ('000)** | 43,439 | 93% |
| | • Scheduled | 92% | 87% |
| | • International | 90% | 93% |
| | **Air Cargo (in tonnes)** | 1,226,427 | 89% |
| | • Air Freight | 90% | 79% |
| | • Air Mail | 10% | 307% |
| **Orly (ORY)**<br><br>Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 245,686 | 27% |
| | **Terminal PAX ('000)** | 25,330 | 4% |
| | • Scheduled | 95% | 10% |
| | • International | 35% | -2% |
| | **Air Cargo (in tonnes)** | 134,612 | -53% |
| | • Air Freight | 90% | -52% |
| | • Air Mail | 10% | -60% |
| **Le Bourget and other airports**<br><br>Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 989,247 | -12% |
| | **Terminal PAX ('000)** | 70 | -9% |
| | • Scheduled | n/a | n/a |
| | • International | n/a | n/a |
| | **Air Cargo (in tonnes)** | n/a | n/a |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| Runways and Passenger Facilities | **Roissy-Charles-de Gaulle (CDG)**<br>• 4 runways ( 2 x 3,615 m, 2 x 3,600 m)<br>• 3 passenger terminals<br>**Orly (ORY)**<br>• 3 runways (3,650 m, 3,320 m, 2,400 m) - the third runway is infrequently used only.<br>• 2 passenger terminals | | |
| Nature of Traffic | **Roissy-Charles-de Gaulle (CDG)**<br>PAX: Mainly scheduled international traffic (82%).<br>Cargo: Freight steadily increasing. Mail steadily increased until 1998, in 1999 it decreased for the first time. Postal hub.<br>**Orly (ORY)**<br>PAX: Mainly scheduled domestic traffic (64%).<br>Cargo: Freight dropped 38% in 1999. Mail also decreased.<br>**Le Bourget and other airports**<br>Their main activities are business and general aviation.<br>Their aircraft movements in 1999 accounted for 58% of all aircraft movements generated by Aeroports de Paris. | | |
| **Accounting Principles/Policies and Accounting Specifics**<br>• 1998 and 1995, increase in capital.<br>• 1983: Special Accounting Plan for Aéroports de Paris.<br>• 1982: French Government's Revised General Accounting Plan. | | | |

**ADP – Aeroports de Paris Group, France (cont'd)**

**Ownership and Regulation**
Publicly Owned

**Major Investments in Fixed Assets**

- *[ADP continues investment of 2.3bn EUR (15bn FRF) until 2005 into its airports, with a major focus on CDG.]*

**CDG**

- *[2001 runway 4 opened, improvement of runways 1 and 2 finished]*
- 1999 terminal extensions, a runway 3 and a second control tower are put in service.
- Throughout the '90s ADP managed a large-scale development of CDG facilities. This will continue under the new investment programme.

**ORY**

- The airport cannot increase in size but is concentrating its efforts on providing quality and comfort. Therefore, it continues to improve and modernise its facilities. Major projects were undertaken throughout the '90s.

**Major Financial Investments and Participations**

- In other countries, ADP works through its subsidiary ADP Management (ADPM), in which it holds a 66% stake. Activities include e.g.:
- *[2000: 9.9% share in Beijing International Airport (BCIA-Beijing) and consulting projects in Japan, Tunisia, Morocco, China, Abu Dhabi, Dubai, etc.]*
- 25% share in Liége Airport (SAB-Liége), Belgium
- Aeroports de Cameroon (ADC, 7 airports)
- Madagaskar (ADEMA, 12 airports)
- Conakry (SOGEAC, Guinea)
- Mexico III – North Central Group (13 airports)
- Phnom Penh (CAMS, Cambodia)
- St. Petersburg (Russia)

**Extraordinary Events and Other Factors**
ADP includes CDG, ORY, Le Bourget and 11 local airports.

Note: *[Information concerning events after the period covered in the data analysis.]*

## ADR – Aeroporti di Roma, Italy

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| **Fiumicino (FCO)** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movements** | 260,581 | 48% |
| | **Terminal PAX ('000)** | 23,607 | 32% |
| | • Scheduled | 98% | 33% |
| | • International | 51% | 39% |
| | **Air Cargo (in tonnes)** | 185,153 | -35% |
| | • Air Freight | 78% | -39% |
| | • Air Mail | 22% | -16% |
| **Ciampino (CIA)** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movements** | 25,115 | -33% |
| | **Terminal PAX ('000)** | 642 | 20% |
| | • Scheduled | 40% | 2,321% |
| | • International | 98% | 33% |
| | **Air Cargo (in tonnes)** | 14,616 | 176% |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| Runways and Passenger Facilities | **Fiumicino (FCO)**<br>• 3 runways (2 x 3,900 m, 1 x 3,295 m)<br>• 2 passenger terminals<br>**Ciampino (CIA)**<br>• 1 runway (2,197 m)<br>• 3 passenger terminals | | |
| Nature of Traffic | **Fiumicino (FCO)**<br>PAX: Mainly scheduled traffic (98%). Domestic and international traffic are almost equally high.<br>Cargo: Freight and mail are rapidly decreasing.<br>**Ciampino (CIA)**<br>PAX: Mainly non-scheduled traffic (60%).<br>Cargo: Steadily increasing. No details on freight and mail. | | |

**Accounting Principles/Policies and Accounting Specifics**

- Management of the airports (FCO, CIA) is carried out under a concession granted by the Italian Ministry of Transport and Shipping. The current concession will expire in 2044.
- In 1998, increase in capital.
- Between 1996 and 1999 reduction of staff (20%), mainly due to the sale of the catering divisions.
- 1993, new company structure which involved a drop in total assets and liabilities, operating costs decreased which increased net profit.

**Ownership and Regulation**

*[Change of Shareholders (July 2002)*

- *50.9% Leonardo SpA*
- *44.7% Macquarie Airports*
- *4.4% local chamber of commerce/regional authorities*

*29 March 2001 Delisted at the Stock Exchange*

*Fully Privatised (2000)*

- *95.6% Leonardo SpA*
- *4.4% local chamber of commerce/regional authorities]*

## ADR – Aeroporti di Roma, Italy (cont'd)

**Ownership and Regulation (cont'd)**

Change in Shareholder (November 1999)

- 51.8% IRI SpA (Instituto per la Riconstruzione Industr.)
- 1.6% each Lazio Regional Authority, Municipality of Rome
- 1.6% shareholders < 1%: Rome Chamber of Commerce, Rome Provincial Authority, Municipality of Fiumicino
- 45.0% outstanding (free float)

Partially Privatised (1997) - IPO 45% of shares were floated

- 54.2% Aeroporti di Roma Holding SpA
- 0.8% Rome Chamber of Commerce
- 45.0% Outstanding (free float)

Publicly Owned until 1997

**Major Investments in Fixed Assets**

Since 1997, ADR invested 886mio EUR (947mio USD) in its airports. The investment was mainly for upgrading and modifying existing facilities. In 2000 FCO opened a new domestic passenger terminal (76mio EUR / 69mio USD).

**Major Financial Investments and Participations**

- 1998: Airports Company South Africa (ACSA) 20% share (11 airports) and ADR International Airports South Africa 69% share.
- 1997: Aeroporto di Genova 15% share capital and Societa Aeroportuale Calabrese 10% share capital.

**Extraordinary Events and Other Factors**

- ADP includes FCO and CIA.
- Provides ground handling service.

Note: *[Information concerning events after the period covered in the data analysis.]*

## AMS – Schiphol Group, Netherlands

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| **Amsterdam (AMS)** | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 409,999 | 67% |
| Airport Size | **Terminal PAX ('000)** | 36,425 | 125% |
| | • Scheduled | 88% | 140% |
| | • International | 100% | 125% |
| | **Air Cargo (in tonnes)** | 1,225,284 | 94% |
| | • Air Freight | 96% | 95% |
| | • Air Mail | 4% | 74% |
| **Rotterdam (RTM)** | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 107,727 | -3% |
| Airport Size | **Terminal PAX ('000)** | 628 | 116% |
| | • Scheduled | 69% | 78% |
| | • International | 94% | 116% |
| | **Air Cargo (in tonnes)** | 1,603 | -48% |
| | • Air Freight | 100% | -47% |
| | • Air Mail | 0% | -99% |
| **Eindhoven (EIN)** | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 25,139 | n/a |
| Airport Size | **Terminal PAX ('000)** | 297 | n/a |
| | • Scheduled | 78% | n/a |
| | • International | 75% | n/a |
| | **Air Cargo (in tonnes)** | 219 | n/a |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| **Lelystad** | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 145,230 | n/a |
| Airport Size | **Terminal PAX ('000)** | n/a | n/a |
| | • Scheduled | n/a | n/a |
| | • International | n/a | n/a |
| | **Air Cargo (in tonnes)** | n/a | n/a |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| Runways and Passenger Facilities | **Amsterdam (AMS)**<br>• 5 runways (3.800 m, 3,490 m, 3,400 m, 3,300 m, 3,450 m, 2,018 m), fifth runway is rarely used.<br>• 1 passenger terminal<br>**Rotterdam (RTM):** 1 runway (2,200 m)<br>**Eindhoven (EIN):** 1 runway (3,000 m)<br>**Lelystad:** 2 runways (1,250 m, 430 m) | | |
| Nature of Traffic | **Amsterdam (AMS)**<br>PAX: Mainly scheduled international traffic (88%).<br>Cargo: Freight steadily increases. Mail varies but increases.<br>**Rotterdam (RTM)** (since 1990)<br>PAX: Mainly international traffic (94%).<br>Cargo: Freight constantly decreasing. Mail is almost zero. | | |

## AMS – Schiphol Group, Netherlands (cont'd)

| | |
|---|---|
| Nature of Traffic (cont'd) | **Eindhoven (EIN)** (since 3/1998 – 50.5%)<br>PAX: Mainly scheduled traffic (78%)<br>Cargo: No details on freight or mail.<br>**Lelystad** (since 1993)<br>PAX and Cargo: Due to the nature of the airfield there is no statistics on PAX or cargo handling.<br>Aircraft movement is for general aviation only. |

**Accounting Principles/Policies and Accounting Specifics**

- Amsterdam Airport Schiphol does not pay corporate taxes in the Netherlands.
- 1999, net profit was reduced by extraordinary expenses for allocation made due to restructuring provision.

**Ownership and Regulation**

Publicly Owned

- 75.8% Dutch State
- 21.8% City of Amsterdam
- 2.4% City of Rotterdam

**Major Investment in Fixed Assets**

- **AMS**: *[A fifth main runway opened in 2003. Further extensions of the facilities were made to accommodate traffic growth.]* 1993 terminal extension and the fifth pier were completed. 1990, expanded west end passenger terminal opened.
- 1991, Eurohub, a purpose-built transfer terminal for 6 clients and 1 airline, opened.
- Between 1984 and 1995 Schiphol invested 142mio EUR (159mio USD) in new capital works, in addition to the initial 85mio EUR (95mio USD), in the new Main Terminal (an eight year project for a single client).

**Major Financial Investments and Participations**

- JV Pantares has 37.5% of the consortium which is developing a logistics centre at Hong Kong airport.
- 1998, 50.5% share in Eindhoven
- 1997, 40% share in New York JFK International terminal
- 1997, 16% share in Brisbane Airport Corporation
- 1995, 1% share in Vienna Airport
- 1993, Lelystad
- 1990, Rotterdam, RTM

**Extraordinary Events and Other Factors**

- Schiphol Group includes AMS, RTM, EIN and Lelystad
- **EIN** is operated jointly by civil and military authorities. A few charter flights use the airport during the holiday season.
- **RTM** is owned by the Municipality of Rotterdam and run by Schiphol Group under the terms of an agreement with the Municipality of Rotterdam.

Note: *[Information concerning events after the period covered in the data analysis.]*

## BAA Group, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 1,238,800 | 11% |
| | **Terminal PAX ('000)** | 117,910 | 64% |
| | • Scheduled | 87% | 70% |
| | • International | 82% | 71% |
| | **Air Cargo (in tonnes)** | 1,961,254 | 82% |
| | • Air Freight | 92% | 86% |
| | • Air Mail | 8% | 42% |
| Runways and Passenger Facilities | See individual airports:<br>• ABZ, EDI, GLA, LGW, LHR, STN | | |
| Nature of Traffic | PAX: Mainly international traffic (82%).<br>Cargo: Freight and mail steadily increase. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1997/98 P&L includes extraordinary expense for windfall taxes.
- Since 1995, BAA increased its activities in other areas besides UK airports. Revenue generation is no longer from airports only but also from World Duty Free.
- Since 1995/96, small increases in share capital. In 1994/95 and 1990/91, major capital increases.
- On 31 July 1986, the main airport assets were transferred from the British Airports Authority to the individual airport companies.

**Ownership and Regulation**

- BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) is responsible for undertaking periodic reviews of the respective RPI-X price caps.
- 27.07.1987, Going Public of BAA plc, capitalisation 1,740mio EUR (1,225mio GBP). All of the government's shareholding was sold except for a 'golden share', which was retained in order to prevent unfriendly takeover bids.
- 01.08.1986, the British Airports Authority was dissolved and its responsibilities were assumed by the BAA plc.

**Major Investments in Fixed Assets**

- See individual airports: ABZ, EDI, GLA, LGW, LHR, STN

**Major Financial Investments and Participations**

- 1997, Naples, NAP, (70%) and acquisition of World Duty Free
- Australian airports: Alice Springs, Darwin, Launceston, Melbourne, Perth, Tennant Creek
- 1996, launch of World Duty Free
- 1992, sale of Prestwick Airport and winning of a 15-year retailing and catering contract for Pittsburgh Airport, USA
- 1990, acquisition of Southampton Airport

**Extraordinary Events and Other Factors**

The 1986 reorganisation of the British Airports Authority into a holding company and subsidiary companies is the most significant change since the creation of the former Authority in 1965. BAA had originally been established as the public authority responsible for all state-owned airports. The government announced the eventual privatisation of BAA in 1984, followed by the Airports Bill in 1986.

## BER – Berlin Group, Germany

| | | | | |
|---|---|---|---|---|
| Period Covered | 1 January 1994 – 31 December 1999 | | | |
| **Tegel (TXL)**<br><br>Airport Size | | Total 1999 | Growth | |
| | | | 90 – 99 | 94 – 99 |
| | **Aircraft Movements** | 124,795 | 29% | 30% |
| | **Terminal PAX ('000)** | 9,542 | 44% | 32% |
| | • Scheduled | 90% | 47% | 43% |
| | • International | 41% | 152% | 33% |
| | **Air Cargo (in tonnes)** | 31,552 | 6% | -6% |
| | • Air Freight | 50% | 4% | -5% |
| | • Air Mail | 50% | 9% | -6% |
| **Schoenefeld (SXF)**<br><br>Airport Size | | Total 1999 | Growth | |
| | | | 90 – 99 | 94 – 99 |
| | **Aircraft Movements** | 43,419 | 31% | -20% |
| | **Terminal PAX ('000)** | 1,861 | -1% | 3% |
| | • Scheduled | 51% | -44% | 29% |
| | • International | 95% | -5% | 2% |
| | **Air Cargo (in tonnes)** | 9,935 | -40% | 4% |
| | • Air Freight | 94% | -34% | 61% |
| | • Air Mail | 6% | -76% | -85% |
| **Tempelhof (THF)**<br><br>Airport Size | | Total 1999 | Growth | |
| | | | 90 – 99 | 94 – 99 |
| | **Aircraft Movements** | 49,429 | 412% | -22% |
| | **Terminal PAX ('000)** | 840 | 855% | -19% |
| | • Scheduled | 98% | 850% | -19% |
| | • International | 35% | 9,733% | -23% |
| | **Air Cargo (in tonnes)** | 166 | -62% | -89% |
| | • Air Freight | 100% | -62% | -88% |
| | • Air Mail | 0% | 0% | -100% |
| Runways and Passenger Facilities | **Tegel (TXL)**<br>• 2 runways (3,023 m, 2,424 m)<br>• 1 passenger terminal<br>**Schoenefeld (SXF)**<br>• 2 runways (3,230 m. 2,917 m)<br>• 1 passenger terminal<br>**Tempelhof (THF)**<br>• 2 runways (2,116 m, 2,094 m)<br>• 1 passenger terminal | | | |
| Nature of Traffic | **Tegel (TXL)**<br>PAX: Mainly scheduled domestic traffic (59%).<br>Cargo: Freight and mail are almost equally high and both are decreasing.<br>**Schoenefeld (SXF)**<br>PAX: Almost equally scheduled/non-scheduled international traffic (49%/46%).<br>Cargo: Freight decreasing since 1998. Mail sharply decreasing. | | | |

## BER – Berlin Group, Germany (cont'd)

| Nature of Traffic (cont'd) | **Tempelhof (THF)**<br>PAX: Mainly scheduled domestic traffic (64%).<br>Cargo: Freight is decreasing. Since 1996 no more mail. |
|---|---|

**Accounting Principles/Policies and Accounting Specifics**

- 1997, 1996, 1995, increase in capital.
- Since 1997, plans for privatisation and for building a single-airport for Berlin needed high amounts of investment. For example in 1998, as a result of the privatisation process of the BBF, net profit was reduced by 46.9mio EUR (92.7mio DEM) due to extraordinary depreciation (15.2mio EUR / 30.1mio DEM) and devaluation of the originally intended construction sites (31.7mio EUR / 62.6mio DEM) of the new Berlin Brandenburg International (BBI).
- 1994-1999, net profit was always negative and operating profit was slightly positive in 1999, 1997, and 1995 only.
- BBF was established in 1992 after the German reunification.

**Ownership and Regulation**

Publicly Owned

- 37% State of Brandenburg
- 37% State of Berlin
- 26% Federal Republic of Germany

**Major Investments in Fixed Assets**

- Between 1997-1999, more than 61mio EUR (120mio DEM) were invested into the planning process of BBI and privatisation of BBF.
- In 1996, approval was granted to expand SXF in order to serve as a single airport for Berlin. Upon completion, TXL and THF will be closed.
- **TXL**
  *[In 2000, investment of 12.7mio EUR (24.8mio DEM) was approved in order to expand the capacity of the airport.]*
  During the '90s, investment made was mainly to renovate and modernize existing facilities.
- **SXF**
  1999, new cargo centre opened (14.3mio EUR / 28mio DEM).
  Major renovation and extension of the runways, parking facilities and terminals have been made throughout the '90s.
- **THF**
  1996, extension of runway from 1,840 m to 2,116 m completed.
  1994, General Aviation Terminal opens.
  During the '90s, investment made was mainly to renovate and modernize existing facilities.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors**

- BBF consists of TXL, SXF and THF.
- TXL and THF are located in former West Berlin, SXF in former East Berlin.

Note: *[Information concerning events after the period covered in the data analysis.]*

**BFS – Belfast, UK**

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 103,457 | 7% |
| | **Terminal PAX ('000)** | 3,087 | 35% |
| | • Scheduled | 75% | 22% |
| | • International | 29% | 114% |
| | **Air Cargo (in tonnes)** | 41,475 | 33% |
| | • Air Freight | 65% | 17% |
| | • Air Mail | 35% | 78% |
| Runways and Passenger Facilities | • 2 runways (2,777 m, 1,951 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly scheduled domestic traffic (70%).<br>Cargo: Freight slightly increasing. Mail steadily increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1996/97, increase of reserves for goodwill write-off.
- 1994/95 and 1995/96, negative shareholders' funds.
- 1994/95, decrease of share capital and increase in share premium account.

**Ownership and Regulation**

Change in Ownership (August 1996)

- TBI plc (Thomas Bailey International)

Fully Privatised (1994)

- Management buyout

Publicly Owned (until 1994)

**Major Investments in Fixed Assets**

- *[2000, additional apron space and 2 new freight buildings.]*
- 1991, opening of new cargo complex (10mio EUR / 7mio GBP) with dedicated terminal and associated offices, incl. apron extension to accommodate all sizes of freighter aircraft.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

Note: *[Information concerning events after the period covered in the data analysis.]*

## BHX – Birmingham, UK

<table>
<tr><td>Period Covered</td><td colspan="3">1 April 1990 – 31 March 2000</td></tr>
<tr><td rowspan="5">Airport Size</td><td></td><td>Total<br>1999/2000</td><td>Growth<br>1990/91 – 1999/00</td></tr>
<tr><td>Aircraft Movements</td><td>121,143</td><td>33%</td></tr>
<tr><td>Terminal PAX ('000)<br>• Scheduled<br>• International</td><td>7,001<br>60%<br>84%</td><td>102%<br>107%<br>118%</td></tr>
<tr><td>Air Cargo (in tonnes)<br>• Air Freight<br>• Air Mail</td><td>25,945<br>93%<br>7%</td><td>9%<br>6%<br>96%</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Runways and<br>Passenger Facilities</td><td colspan="3">• 2 runways (2,605 m, 1,315 m)<br>• 2 passenger terminals</td></tr>
<tr><td>Nature of Traffic</td><td colspan="3">PAX: Mainly scheduled international traffic (44%).<br>Cargo: Freight and mail volumes vary but on average increase.</td></tr>
<tr><td colspan="4">Accounting Principles/Policies and Accounting Specifics<br>• 1997/98, increase in capital (ordinary shares and restructuring).<br>• 1993/94, increase in preferred shares.</td></tr>
<tr><td colspan="4">Ownership and Regulation<br>[Change in Ownership (Dec 2001)<br>• 49% West Midlands' Local Authorities<br>• 24.125% AerRianta<br>• 24.125% Macquarie Airports Group Limited<br>• 2.75% Employee Share Trust<br>Change in Ownership (June 2000)<br>• 49% West Midlands' Local Authorities<br>• 48.25% AerRianta/Bridgepoint Capital (formerly Nat West Ventures)<br>• 2.75% Employee Share Trust]<br>Partially Privatised (March 1997)<br>• 49% West Midlands' Local Authorities<br>• 40% AerRianta/Nat West Ventures<br>• 4.25% National Car Parks Ltd.<br>• 4% John Laing Holdings<br>• 2.75 % Employee Share Trust<br>'Pseudo' partial privatisation (1989) via establishing the Eurohub (Birmingham) Ltd.<br>• 25% Birmingham International Airport<br>• 21.4% British Airways<br>• 21.4% National Car Parks<br>• 14.3% District Councils<br>• 11.9% John Laing Holdings<br>• 6% Forte<br>Public Ownership (since 1987)<br>• Birmingham International Airport plc, owned by the 7 West Midlands district councils<br>Publicly Owned (until 1986)<br>• Birmingham City Council</td></tr>
</table>

**BHX – Birmingham, UK (cont'd)**

| **Major Investments in Fixed Assets** |
|---|
| • *[2000, opening of arrival concourses linking the two terminals.]*<br>• During the '90s, 356mio EUR (260mio GBP) investment in modernization of airside and landside facilities.<br>• 1991, opening of second terminal (The Eurohub). |
| **Major Financial Investments and Participations:** n/a |
| **Extraordinary Events and Other Factors:** n/a |

Note: *[Information concerning events after the period covered in the data analysis.]*

**BRS – Bristol, UK**

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 61,968 | -14% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 1,979<br>44%<br>81% | 147%<br>268%<br>126% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 8,459<br>1%<br>99% | 174%<br>-90%<br>339% |
| Runways and Passenger Facilities | • 1 runway (2,011 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly non-scheduled traffic (56%).<br>Cargo: Very low freight volume. Mail is increasing.<br>Movements: Other movements account for almost 50% due to the fact that a number of business (and private) aircraft are based at the airport. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1998/99 and 1999/00, increase in fixed assets by 270%.
- 1997/98, other operational expenses increased by 140% resulting in negative operating profit, negative net profit and a drop in shareholders' funds.
- Since 1997, the number of employees declined by more than 40%.

**Ownership and Regulation**

*[Fully Privatised (January 2001)*

- *Sold to Macquarie Bank/Cintra Concessions (Ferrovial)]*

Partially Privatised (December 1997)

- 51% FirstGroup plc (prev. FirstBus)
- 49% Bristol City Council

Publicly Owned

- Bristol City Council (municipal)

**Major Investments in Fixed Assets**

- *[12/2001, opening of new traffic control tower (5.5mio EUR / 3.5mio GBP).]*
- 2000, opening of new terminal 2 (42mio EUR / 27mio GBP), the old terminal was closed for the public.
- 1998, FirstGroup invested 47mio EUR (32mio GBP) in the development of the airport. The old terminal was refurbished and modernised, construction works of the second terminal were started.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

Note: *[Information concerning events after the period covered in the data analysis.]*

## BRU – Brussels, Belgium

| | | | | |
|---|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1997 | | | |
| Airport Size | | Total 1999 | Growth | |
| | | | 90 – 99 | 90 – 97 |
| | **Aircraft Movements** | 313,929 | 63% | 44% |
| | **Terminal PAX ('000)** | 19,966 | 141% | 91% |
| | • Scheduled | 84% | 146% | 91% |
| | • International | 100% | 141% | 91% |
| | **Air Cargo (in tonnes)** | 656,302 | 102% | 63% |
| | • Air Freight | 98% | 108% | 68% |
| | • Air Mail | 2% | -21% | -24% |
| Runways and Passenger Facilities | • 3 runways (3,638 m, 3,211 m, 2,984 m)<br>• 1 passenger terminal | | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (84%).<br>Cargo: Freight steadily increases. Mail steadily decreases. | | | |

**Accounting Principles/Policies and Accounting Specifics**

- Law of 21 March 1991; Daerden Law of 19 December 1997; *[Royal Decree of 2 April 1998]*
- Management contract.
- Until 1997, the number of employees is very low. Salary cost per employee, however, are relatively high.

**Ownership and Regulation**

*[Self-Governing Public Company (1998)*

- *Brussels International Airport Company (BIAC plc), a self-governing public company was established by a merger of BATC and the airport activity branch of the Belgian Airport and Airways Agency (BAAA, subordinate to the Ministry of Transportation), in order to unify the management of the infrastructure and services provided to passengers – since 1987 entrusted to the s.a. BATC – with the operation of the airport site (incl. runways and tarmacs), which had remained under the responsibility of BAAA; transfer of airside assets from the State (except ownership of the ground), increase in capital. Shareholders are: The Belgian State (63.56%), P&V Assurances (4.91%), Societe Generale de Belgique S.A. (4.84%), 5 other shareholders with around 4.5% of shares and 4 companies with approximately 1% of shares.]*

Fully Privatised (1987)

- Brussels Airport Terminal Company (BATC)

**Major Investments in Fixed Assets**

- *[3/1999, construction of Pier A began which became operational in May 2002. Costs approximately 206mio EUR (8.3bn BEF).]*
- During '90s, two new passenger terminals, concourses, and transfer facilities were constructed, which opened in 1994 and are fully operational in 2002, replacing or extending the old passenger facilities.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors**

Brussels Airport Terminal Company (BATC) had been established (1987) as a private entity, in order to manage the passenger building, incl. refurbishing and managing of the existing facility, as well as the construction and management of new extensions.

Note: *[Information concerning events after the period covered in the data analysis.]*

## BSL – Basel Mulhouse, Switzerland

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 Dec 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 124,956 | 18% |
| | **Terminal PAX ('000)** | 3,536 | 91% |
| | • Scheduled | 75% | 110% |
| | • International | 77% | 116% |
| | **Air Cargo (in tonnes)** | 72,932 | 152% |
| | • Air Freight | 96% | 166% |
| | • Air Mail | 4% | 17% |
| Runways and Passenger Facilities | • 2 runways (3,900 m, 1,600 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (53%).<br>Cargo: Freight steadily increasing. Mail varies but slightly increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1999, very high depreciation due to major investment activities.
- 1993-1995, negative net profit.
- Due to its legal status and ownership structure the airport does not record any shareholders' funds. Therefore, equity/net assets is zero.

**Ownership and Regulation**

Publicly Owned

**Major Investments in Fixed Assets**

An investment of 363mio EUR (2.4bn FRF) has been made to allow expansion work between 1997 and 2004 (extension of terminal facilities, enlargement of flight centre, covered parking spaces and construction of Y-shaped finger dock).

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors**

The world's only completely bi-national airport is situated entirely within French territory, though it has a Swiss customs sector connected to Basel via a customs road. In the framework of the state agreement of 1949, the 'EuroAirport' is a public law company under international law, domiciled in France.

## CGN – Cologne, Germany

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 151,335 | 27% |
| | **Terminal PAX ('000)** | 6,012 | 92% |
| | • Scheduled | 84% | 117% |
| | • International | 51% | 129% |
| | **Air Cargo (in tonnes)** | 410,436 | 128% |
| | • Air Freight | 95% | 140% |
| | • Air Mail | 5% | 16% |
| Runways and Passenger Facilities | • 3 runways (3,800 m, 2,459 m, 1,866 m)<br>• 2 passenger terminals | | |
| Nature of Traffic | Since 1999 cargo-hub.<br>PAX: Mainly scheduled domestic traffic (47%).<br>Cargo: Freight steadily increasing. Mail steadily decreasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1996, high extraordinary expenses (legal requirement for railway financing) caused a negative net profit and a drop in shareholders' funds/net assets.
- 1990-1995, recorded net profit is zero as all income before taxes is paid as tax to the public owners.

**Ownership and Regulation**

Publicly Owned

- 31.12% Municipal of Cologne
- 30.94% Federal Republic of Germany
- 30.94% State of Nordrhein-Westfalen
- 6.06% Municipal of Bonn
- 0.59% Rhein-Sieg-Kreis
- 0.35% Rheinisch-Bergischer Kreis

**Major Investments in Fixed Assets**

- *[9/2000 new passenger terminal opened.]*
- 1998, new parking facility (20mio EUR / 40mio DEM).
- 1997, start of construction for a new terminal (266mio EUR / 525mio DEM) and a railway station (51mio EUR / 100mio DEM).
- 1990-1995, investment into new parking facilities, new control tower and administration building.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors**

- No night curfew.
- Provides ground handling services.
- 1996, after the fire in DUS terminal CGN temporarily took over most of the traffic.

Note: *[Information concerning events after the period covered in the data analysis.]*

## CPH – Copenhagen, Denmark

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| **Copenhagen (CPH)** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movements** | 298,533 | 40% |
| | **Terminal PAX ('000)** | 17,271 | 39% |
| | • Scheduled | 92% | 42% |
| | • International | 88% | 52% |
| | **Air Cargo (in tonnes)** | 315,348 | 77% |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| **Roskilde** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movement** | 96,214 | -3% |
| | **Terminal PAX ('000)** | 29 | -29% |
| | • Scheduled | 83% | -37% |
| | • International | 31% | -18% |
| | **Air Cargo (in tonnes)** | n/a | n/a |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| Runways and Passenger Facilities | **Copenhagen (CPH)**<br>• 3 runways (3,600 m, 3,300 m, 2,800 m)<br>• 3 passenger terminals | | |
| Nature of Traffic | **Copenhagen (CPH)**<br>Hub airport.<br>PAX: Mainly scheduled international traffic (80%).<br>Cargo: Steadily increasing. No details on freight or mail.<br>**Roskilde**<br>Roskilde handles general aviation traffic.<br>PAX: Mainly scheduled domestic traffic (52%).<br>Cargo: There is no cargo activity. | | |
| **Accounting Principles/Policies and Accounting Specifics**<br>• 1994, 1996, *[2000]*, capital increase due to public offerings.<br>• 1 Oct 1990, Copenhagen Airports A/S took over the public Copenhagen Airports Authority.<br>• Jan-Sep 1990, no detailed information on income distribution available. | | | |
| **Ownership and Regulation**<br>*[Change in Ownership (2000)*<br>• *Offering, additional 17% of shares were floated]*<br>No shareholder - other than the Danish government (33.8%), the Danish Employees Capital Pension Fund (ATP), LD Pensions and Taube Hodson Stonex Partners Ltd. - holds more than 5% of the shares.<br>Change in Ownership (1996)<br>• Secondary Offering, 24% of shares were floated<br>Partially Privatised (1994)<br>• IPO, 25% of shares were floated<br>Change in Company Structure (Oct 1990)<br>• Copenhagen Airports A/S took over the ownership and operation of CPH (Kastrup) and Roskilde. The Kingdom of Denmark remains the sole shareholder. | | | |

**CPH – Copenhagen, Denmark (cont'd)**

**Ownership and Regulation (cont'd)**

Publicly Owned (until Oct 1990)

- Owned by the Danish Government and operated by the Copenhagen Airport Authority, a public corporation under the Danish Ministry of Transport.

**Major Investments in Fixed Assets**

- *[Until 2005, CPH will invest 1.1bn EUR (1bn USD) in the extension of the airport.]*
- 1999, first stage of new Pier D was completed.
- 1998, constructions completed for the connection between the two terminals, the new arrival hall, modern baggage handling, underground parking and a delta-shaped terminal (Terminal 3).
- 1992, two more cargo units were added.
- 1989, new domestic terminal, expanded parking facilities and a new cargo centre were completed.

**Major Financial Investments and Participations**

- *[2001, Newcastle-NCL (49%)]*
- Dec 1998, Mexico I – Southeast Group (9 airports)

**Extraordinary Events and Other Factors**

Copenhagen Airports A/S includes CPH (Copenhagen, Kastrup) and Roskilde, which handles general aviation.

Note: *[Information concerning events after the period covered in the data analysis.]*

## CWL – Cardiff, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 63,181 | -1% |
| | **Terminal PAX ('000)** | 1,308 | 125% |
| | • Scheduled | 24% | 264% |
| | • International | 92% | 132% |
| | **Air Cargo (in tonnes)** | 3,091 | -13% |
| | • Air Freight | 18% | -44% |
| | • Air Mail | 82% | -1% |
| Runways and Passenger Facilities | • 2 runways (2,354 m, 1,119 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly non-scheduled traffic (76%).<br>Cargo: Very low freight volume. Mail is increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1999/00, shareholders' funds decreased by more than 30%.
- 1991/92, operating profit almost zero; due to positive financial result net profit is higher than operating profit.

**Ownership and Regulation**

Fully Privatised (April 1995)

- TBI plc (Thomas Bailey International)

Publicly Owned (until 1995)

- Publicly owned since its opening in 1952

**Major Investments in Fixed Assets**

Between 1995 and 2001, TBI invested 32mio EUR (23mio GBP) in existing airport facilities.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

## DUS –Dusseldorf, Germany

<table>
<tr><td>Period Covered</td><td colspan="3">1 January 1990 – 31 December 1995</td></tr>
<tr><td rowspan="8">Airport Size</td><td rowspan="2"></td><td rowspan="2">Total 1999</td><td colspan="2">Growth</td></tr>
<tr><td>90 – 99</td><td>90 – 95</td></tr>
<tr><td>Aircraft Movements</td><td>194,065</td><td>25%</td><td>19%</td></tr>
<tr><td>Terminal PAX ('000)</td><td>15,859</td><td>37%</td><td>30%</td></tr>
<tr><td>• Scheduled</td><td>89%</td><td>128%</td><td>89%</td></tr>
<tr><td>• International</td><td>76%</td><td>40%</td><td>28%</td></tr>
<tr><td>Air Cargo (in tonnes)</td><td>61,541</td><td>20%</td><td>21%</td></tr>
<tr><td>• Air Freight</td><td>100%</td><td>33%</td><td>22%</td></tr>
<tr><td>• Air Mail</td><td>0%</td><td>-95%</td><td>15%</td></tr>
<tr><td>Runways and Passenger Facilities</td><td colspan="3">• 3 runways (3,000 m, 2,700 m, 1,630 m)<br>• 1 main terminal connecting concourses A, B and C</td></tr>
<tr><td>Nature of Traffic</td><td colspan="3">PAX: Mainly scheduled international traffic (65%).<br>Cargo: Freight decreasing since 1998. Mail sharply decreasing.</td></tr>
<tr><td colspan="4">Accounting Principles/Policies and Accounting Specifics: n/a</td></tr>
<tr><td colspan="4">Ownership and Regulation<br><u>[Partially Privatised (since 31 December 1997)</u><br>• 50% Airport Partners GmbH [HochTief Airports (60%), AerRianta (40%)]<br>• 50% Municipal Dusseldorf]<br><u>Publicly Owned (until December 1997)</u><br>• 50% Municipal Dusseldorf<br>• 50% State of Nordrhein-Westfalen</td></tr>
<tr><td colspan="4">Major Investments in Fixed Assets<br>• [2001, new terminal (401mio EUR / 785mio DEM) and parking facilities opened.<br>• 2000, new railway station opened (179mio EUR / 350mio DEM), Deutsche Bahn contributes 33mio EUR (65mio DEM).<br>• 1997-2003, the project "airport 2000 plus" is implemented in phases. It is the airport's largest investment project in history and involves the reconstruction and expansion of the airport.<br>• 1996, reconstruction of terminal affected by the fire.]<br>• 1994, opening of extended central terminal, new parking facility (39.3mio EUR / 75mio DEM), first phase cargo centre completed (57mio EUR / 108mio DEM), new check-in counters opened.<br>• 1992, completion of new parallel runway. However, only conditional operation of the second runway is authorized (e.g. during peak hours, in case of emergency).<br>• 1992, opening of a new link to the highway system.</td></tr>
<tr><td colspan="4">Major Financial Investments and Participations<br>Dusseldorf Express Airport Monchengladbach (70%)</td></tr>
<tr><td colspan="4">Extraordinary Events and Other Factors<br>• [1999, a new organization structure with independent business units was introduced. It has seven central business divisions which are managed as profit centres.<br>• 11 April 1996, fire at the passenger terminal.]</td></tr>
</table>

Note: *[Information concerning events after the period covered in the data analysis.]*

## EDI – Edinburgh, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 100,900 | -6% |
| | **Terminal PAX ('000)** | 5,225 | 115% |
| | • Scheduled | 93% | 117% |
| | • International | 30% | 325% |
| | **Air Cargo (in tonnes)** | 49,199 | 233% |
| | • Air Freight | 38% | 1,536% |
| | • Air Mail | 62% | 125% |
| Runways and Passenger Facilities | • 3 runways (2,560 m, 1,796 m, 909 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | International routes available dwindled in the early 1980s. Gradually a reasonable choice of domestic services was offered. EDI has also been steadily developed into an important freight centre, particularly for the movement of overnight mail and parcels.<br>PAX: Mainly scheduled domestic traffic (69%).<br>Cargo: Freight is increasing. Mail steadily increasing and dominates (92%) the cargo activities. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1997/98 P&L includes extraordinary expense for windfall taxes.
- On 31 July 1986, the main airport assets were transferred from the British Airports Authority (BAA).

**Ownership and Regulation**

Owned by BAA plc, whose stock is privately owned since 1987.

BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the respective RPI-X price caps.

**Major Investments in Fixed Assets**

- 1999, start of an investment programme to extend and upgrade terminal facilities (156mio EUR / 100mio GBP).
- 1996, start of an investment plan to improve and extend facilities (69mio EUR / 54mio GBP).

**Major Investments in Fixed Assets:** n/a

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Others Factors:** n/a

## EMA – East Midlands, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 1990/91 – 1999 |
| | **Aircraft Movements** | 72,712 | 16% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 2,218<br>36%<br>84% | 76%<br>46%<br>114% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 142,345<br>91%<br>9% | 584%<br>1,065%<br>38% |
| Runways and Passenger Facilities | • 1 runway (2,280 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | Major hub for Royal Mail.<br>PAX: Mainly non-scheduled traffic (64%).<br>Cargo: Since 1993, freight and mail volumes are increasing rapidly. In 1996, EMA was UK's largest cargo airport in handling 20% of the total UK market. | | |

**Accounting Principles/Policies and Accounting Specifics**
1993, change in accounting period, ending 31 December 1993. Data is for 9 months period (1 April-31 Dec 1993).

**Ownership and Regulation**
*[Change in Ownership (March 2001)*
• *Sold to Manchester Airport plc]*
Fully Privatised (August 1993)
• National Express
Publicly Owned
• Local authorities (Derbyshire, Nottinghamshire, Leicestershire and Nottingham City Council)

**Major Investments in Fixed Assets**
• Between 1993 and 2001, National Express invested 104mio EUR (77mio GBP) in the airport infrastructure and passenger facilities, incl. public transportation expansion, railway extension and a new control tower.
• 1996, terminal extension completed (10mio EUR / 8mio GBP). Investment continued in improving catering facilities, adding shops and a more spacious departure lounge.
• 1995, new freight apron was completed (2.4mio EUR / 2mio GBP).

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

Note: *[Information concerning events after the period covered in the data analysis.]*

## FRA –Frankfurt, Germany

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 439,093 | 35% |
| | **Terminal PAX ('000)** | 45,415 | 58% |
| | • Scheduled | 96% | 70% |
| | • International | 82% | 65% |
| | **Air Cargo (in tonnes)** | 1,538,822 | 22% |
| | • Air Freight | 91% | 26% |
| | • Air Mail | 9% | -7% |
| Runways and Passenger Facilities | • 3 runways (each 4,000 m)<br>• 2 passenger terminals | | |
| Nature of Traffic | Hub airport<br>PAX: Mainly scheduled international traffic (78%).<br>Cargo: Freight steadily increasing. Mail decreasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1994, increase in capital.
- 1990-1992, extraordinary expenses for private vehicle traffic and reserves for environmental measures decreased shareholders' funds/net assets and caused negative net profit in 1991 and 1992.

**Ownership and Regulation**

*[Partially Privatised (June 2001)*

*Renamed to Fraport AG, Frankfurt Airport Services Worldwide*

- *2001, IPO, 29% of shares listed at the stock exchange]*

Publicly Owned

- 45,24% State of Hessen
- 28,89% Municipal Frankfurt
- 25,87% Federal Republic of Germany

**Major Investments in Fixed Assets**

- *[New runway and terminal are in planning.]*
- 1999, long-distance train station opened (55mio EUR / 108mio DEM).
- 1994, opening of Terminal 2 for up to 12 mio passengers.
- 1993, new cargo centre and additional check-in counters opened.

**Major Financial Investments and Participations**

- *[2001, Lima]*
- 1999, Manila International Passenger Terminal 3
- 1999, Antalya International Passenger Terminal
- Hahn, Hanover, Saarbrucken
- Minority shareholder Athens and Brisbane.
- Ground handling operator at several airports in Europe.

**Extraordinary Events and Other Factors**

Provides ground handling services and car parking.

Note: *[Information concerning events after the period covered in the data analysis.]*

## GLA – Glasgow, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 98,700 | -11% |
| | **Terminal PAX ('000)** | 6,793 | 60% |
| | • Scheduled | 67% | 49% |
| | • International | 51% | 91% |
| | **Air Cargo (in tonnes)** | 12,315 | -53% |
| | • Air Freight | 76% | -50% |
| | • Air Mail | 24% | -61% |
| Runways and Passenger Facilities | • 2 runways (2,658 m, 1,104 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly scheduled domestic traffic (49%).<br>Cargo: Freight was decreasing but slightly increased in 1999/00.<br>Mail steadily decreasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1997/98 P&L includes extraordinary expense for windfall taxes.
- On 31 July 1986, the main airport assets were transferred from the British Airports Authority (BAA).

**Ownership and Regulation**

Owned by BAA plc, whose stock is privately owned since 1987.

BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the respective RPI-X price caps.

**Major Investments in Fixed Assets**

- Phase two included a new international pier. However, there was a setback in 1994 when several carriers announced a reduction or suspension of services.
- 1996, start of phase one of terminal building expansion.
- 1992, phase one on the 72mio EUR (55mio GBP) project was opened, it provided 70% more space for passengers.
- 1990, forecourt road system and a new car park opened.
- 1989, start of major extension to the terminal building.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Others Factors:** n/a

## GVA – Geneva, Switzerland

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 159,256 | 6% |
| | **Terminal PAX ('000)** | 6,891 | 24% |
| | • Scheduled | 91% | 27% |
| | • International | 84% | 24% |
| | **Air Cargo (in tonnes)** | 51,320 | -22% |
| | • Air Freight | 82% | -18% |
| | • Air Mail | 18% | -7% |
| Runways and Passenger Facilities | • 2 runways (3,900 m, 823 m - grass)<br>• 1 main passenger terminal | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (76%).<br>Cargo: Freight decreasing. Mail shows a trend to increase. | | |

**Accounting Principles/Policies and Accounting Specifics**

- GVA does not pay any taxes.
- 1999, net profit is very high negative due to high extraordinary expenses for "provision indemnities aux riverains" (reserves for payments to neighbours).
- Since 1995, data on investment is available.
- 1990-1992 B/S data was reported under the State of Geneva. In 1993, assets were reported and as of 1994 also shareholders' funds/net assets.

**Ownership and Regulation**

Change in Company Structure (1994)

- Became an independent public organization.

Publicly Owned

**Major Investments in Fixed Assets**

An investment plan for 313mio EUR (500mio CHF) will be realised between 1998 and 2005. It involves the improvement and extension of the terminals, including a y-shaped satellite terminal to serve wide body jets.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

## HAJ –Hanover, Germany

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 94,711 | -1% |
| | **Terminal PAX ('000)** | 5,008 | 83% |
| | • Scheduled | n/a | n/a |
| | • International | 79% | 147% |
| | **Air Cargo (in tonnes)** | 14,671 | -33% |
| | • Air Freight | 43% | -48% |
| | • Air Mail | 57% | -16% |
| Runways and Passenger Facilities | • 2 runways (3,800 m, 2,340 m)<br>• 3 passenger terminals | | |
| Nature of Traffic | PAX: Mainly international traffic (79%).<br>Cargo: Freight and mail are decreasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1998 and 1999, negative net profit.
- 1997, increase in capital.
- The company Flughafen Hannover has two 100% subsidiaries: since 1995, Verkehrsdienste (VFH) and since 1984, Air Service Hanover (ASH). The financial data and staff numbers of these companies are included in the financial statements of Flughafen Hannover GmbH.
- 1990, other income and depreciation were adjusted for accounting reasons. Therefore, both are much higher in 1990 than the following years.

**Ownership and Regulation**

*[Change in Ownership Structure (2003)*

- *35% Municipal Hanover*
- *35% Beteiligungsgesellschaft mbH, Hannover*
- *30% Fraport AG, Frankfurt]*

Partially Privatised (since 21 July 1998)

- 35% Municipal Hanover
- 35% Beteiligungsgesellschaft mbH, Hannover
- 20% Fraport AG, Frankfurt
- 10% Norddeutsche Landesbank Girozentrale, Hannover

Publicly Owned (until 1998)

- 50% Municipal Hannover
- 50% State of Niedersachsen

**Major Investments in Fixed Assets**

- 1999, extension of apron and remote parking stands.
- 1998, third passenger terminal for 8 mio passengers opened (253mio EUR / 500mio DEM) and a new multi-storey car park (20mio EUR / 40mio DEM).
- 1997, 1994, 1993, new multi-storey car park opened.
- 1992, cargo facility expansion, additional office building.
- 1990, extension of runway, new multi-storey car park.

**Major Financial Investments and Participations**

1996, HAJ invested in the following companies:

- 50% Gastronomie Flughafen Hanover (GFH)
- 50% Wirtschaftsföderungsgesellschaft (WFG)
- 25.1% Aviation Handling Services (AHS)

**HAJ –Hanover, Germany (cont'd)**

**Extraordinary Events and Other Factors**

- During the '90s, HAJ saw major reorganizations including outsourcing into subsidiaries.
- Provides ground handling services (subsidiary).

Note: *[Information concerning events after the period covered in the data analysis.]*

## HAM – Hamburg, Germany

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 156,525 | 11% |
| | **Terminal PAX ('000)** | 9,379 | 40% |
| | • Scheduled | 74% | 39% |
| | • International | 58% | 48% |
| | **Air Cargo (in tonnes)** | 52,423 | -10% |
| | • Air Freight | 67% | -15% |
| | • Air Mail | 33% | 4% |
| Runways and Passenger Facilities | • 2 runways (3,665 m, 3,200 m)<br>• 4 passenger terminals | | |
| Nature of Traffic | PAX: Mainly scheduled domestic traffic (41%).<br>Cargo: After four years of decrease freight and mail are slightly increasing again in 1999. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1997, increase in capital.
- 1993, very low operating profit, but high extraordinary income (mainly revaluations) provide a positive net profit.
- 1992, negative net profit.

**Ownership and Regulation**

*[Change in Ownership (2002)*

- *51% Hamburger Gesellschaft fuer Beteiligungsverwaltung*
- *49% HochTief AirPort consortium (including AerRianta)*

*Partially privatised (2000), public private partnership*

- *64% Hamburger Gesellschaft fuer Beteiligungsverwaltung*
- *36% HochTief AirPort consortium (including AerRianta)]*

Change in Ownership (since December 1998)

- 74% Hamburger Gesellschaft fuer Beteiligungsverwaltung
- 26% Federal Republic of Germany

Change in Ownership (until December 1998)

- 64% Hamburger Gesellschaft fuer Beteiligungsverwaltung (transfer of Municipal Hamburg's 64% capital share)
- 26% Federal Republic of Germany
- 10% State of Schleswig-Holstein

Publicly Owned (until December 1996)

- 64% Municipal Hamburg
- 26% Federal Republic of Germany
- 10% State of Schleswig-Holstein

**Major Investments in Fixed Assets**

- 1999, new apron put into operation.
- 1994, opening of passenger terminal 4.
- 1991, new parking facility, 5 new gates.
- 1990, new parking facility, new aircraft hanger.

**Major Financial Investments and Participations**

*[HAM 21 is a 400mio EUR investment programme to be implemented until 2007. Major objectives are a new terminal, railway connection, parking facilities and more shopping areas.]*

**HAM – Hamburg, Germany (cont'd)**

| **Major Financial Investments and Participations (cont'd)** |
|---|
| • 1999, foundation of 100% subsidiary SecuService Holding which provides security services, car park operations and other administration services.<br>• 12/1999, FHG-ground handling is transferred to GroundSTARS.<br>• 1997, foundation of first private subsidiary STARS. |
| **Extraordinary Events and Other Factors** |
| • During the '90s, HAM saw major reorganization including outsourcing into subsidiaries.<br>• Provides ground handling services (subsidiary). |

Note: *[Information concerning events after the period covered in the data analysis.]*

## LBA – Leeds Bradford, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 63,191 | 8% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 1,475<br>62%<br>70% | 91%<br>58%<br>206% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 241<br>100%<br>0% | -57%<br>-57%<br>0% |
| Runways and Passenger Facilities | • 2 runways (2,250 m, 1,100 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Scheduled domestic/international and non-scheduled traffic are almost equally high.<br>Cargo: Air freight is decreasing. Since 1998/99, no more mail service. | | |
| **Accounting Principles/Policies and Accounting Specifics**<br>1995/96, operating profit and net profit are very low. | | | |
| **Ownership and Regulation**<br>Publicly Owned<br>• City of Bradford MC, Leeds CC, Calderdale, Kirklees MC and City of Wakefield. | | | |
| **Major Investments in Fixed Assets**<br>• *[2001, new and extended passenger facilities completed.]*<br>• 1998, completion of major terminal expansion. | | | |
| **Major Financial Investments and Participations:** n/a | | | |
| **Extraordinary Events and Other Factors**<br>Since 1993, no night curfew. | | | |

Note: *[Information concerning events after the period covered in the data analysis.]*

## LGW – London Gatwick, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 256,300 | 31% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 30,432<br>64%<br>91% | 49%<br>61%<br>45% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 323,921<br>94%<br>6% | 42%<br>39%<br>127% |
| Runways and Passenger Facilities | • 2 runways (3,316 m, 2,565 m) - the second runway is only used during emergencies or when the main runway is closed, otherwise it serves as a taxiway.<br>• 2 passenger terminals | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (54%).<br>Cargo: Freight steadily increasing. Mail is increasing. | | |
| **Accounting Principles/Policies and Accounting Specifics**<br>• 1997/98 P&L includes extraordinary expense for windfall taxes.<br>• 1988/89, capital increase.<br>• On 31 July 1986, the main airport assets were transferred from the British Airports Authority (BAA). | | | |
| **Ownership and Regulation**<br>Owned by BAA plc, whose stock is privately owned since 1987.<br>BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the respective RPI-X price caps. | | | |
| **Major Investments in Fixed Assets**<br>• 1995, improvement of South Terminal finished.<br>• 1994, redevelopment of North Terminal (101mio EUR / 80mio GBP).<br>• 1988, second terminal (north side) opened (308mio EUR / 200mio GBP). | | | |
| **Major Financial Investments and Participations:** n/a | | | |
| **Extraordinary Events and Others Factors:** n/a | | | |

## LHR – London Heathrow, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 462,400 | 21% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 62,294<br>100%<br>88% | 51%<br>51%<br>62% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 1,385,297<br>93%<br>7% | 84%<br>93%<br>14% |
| Runways and Passenger Facilities | • 3 runways (3,658 m, 3,902 m, 1,966 m) - two main runways and a cross wind runway.<br>• 4 passenger terminals | | |
| Nature of Traffic | Hub airport<br>PAX: Mainly scheduled international traffic (88%).<br>Cargo: Freight and mail are steadily increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1997/98 P&L includes extraordinary expense for windfall taxes.
- On 31 July 1986, the main airport assets were transferred from the British Airports Authority (BAA).

**Ownership and Regulation**

Owned by BAA plc, whose stock is privately owned since 1987.

BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the respective RPI-X price caps.

**Major Investments in Fixed Assets**

- *[11/2001, permission for a fifth terminal (3.9bn EUR / 2.5bn GBP) has been granted. Request had been filed in 1993.]*
- 1998, launch of Heathrow Express (657mio EUR / 450mio GBP).
- Since the mid '90s, investment of 1.3bn EUR (960mio GBP) in airport facilities were made for e.g. improvement of baggage handling, new Terminal 3 wing, redevelopment of Terminals 1, 2 and 4.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors**

Since July 1991, non-scheduled services are allowed to operate at LHR.

Note: *[Information concerning events after the period covered in the data analysis.]*

## LPL – Liverpool, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 81,039 | -15% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 1,513<br>86%<br>62% | 194%<br>192%<br>401% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 42,178<br>60%<br>40% | 60%<br>89%<br>30% |
| Runways and Passenger Facilities | • 1 runway (2,286 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (49%).<br>Cargo: Freight volume varying. Mail slightly increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- LPL changed its accounting period twice during the '90s. The first change occurred in 1990 (1 Apr-31 Dec 90). Data of the preceding reporting period has been combined with the 9 months data, to reflect a full fiscal year. From 1990 to1997, the accounting period was for 12 months, ending 31 December. In 1997/98, the accounting period was changed again to ending 31 March. Data was for 15 months (1 Jan 97-31 Mar 98).
- Number of employees and associated labour costs are extremely fluctuating, e.g. 1999 – 187 employees, 1995 – 6 employees, 1990 – 52 employees.
- 1999-1990, negative operating profit and net profit; no taxes paid.
- 1997-1990, net profit is exceeding operating profit due to financial income.
- 1991/92, increase in capital (ordinary shares) and decrease in preferred shares.

**Ownership and Regulation**

*[Fully Privatised (May 2001)*

- *100% Peel Airports]*

Change in Ownership (1997)

- 76% Peel Airports
- 24% remained with 5 Merseyside local authorities

Partially Privatised (June 1990) [considered fully privatised in terms of decision making since private equity stake > 75%]

- 76% British Aerospace
- 24% remained with 5 Merseyside local authorities

**Major Investments in Fixed Assets**

- *[2001/02, another 66.2mio EUR (42.5mio GBP) were invested to treble the size of the terminal and in a new control tower.]*
- Since 1997, Peel Holdings invested 15mio EUR (10mio GBP) in upgrading the airport facilities.

**Major Financial Investments and Participations**

*[Since early 2002, Peel holds a 50% share in Sheffield Airport]*

**Extraordinary Events and Other Factors**

- Almost all activities outsourced.
- 24 hours operation.

Note: *[Information concerning events after the period covered in the data analysis.]*

## LTN – Luton, UK

<table>
<tr><td>Period Covered</td><td colspan="4">1 April 1990 – 31 March 1998</td></tr>
<tr><td rowspan="8">Airport Size</td><td></td><td>Total 1999/2000</td><td colspan="2">Growth</td></tr>
<tr><td></td><td></td><td>90/91-99/00</td><td>90/91-97/98</td></tr>
<tr><td>Aircraft Movements</td><td>79,988</td><td>25%</td><td>0%</td></tr>
<tr><td>Terminal PAX ('000)</td><td>5,450</td><td>115%</td><td>34%</td></tr>
<tr><td>• Scheduled</td><td>75%</td><td>359%</td><td>142%</td></tr>
<tr><td>• International</td><td>73%</td><td>72%</td><td>14%</td></tr>
<tr><td>Air Cargo (in tonnes)</td><td>29,367</td><td>-10%</td><td>-24%</td></tr>
<tr><td>• Air Freight</td><td>100%</td><td>18%</td><td>0%</td></tr>
<tr><td>• Air Mail</td><td>0%</td><td>-99%</td><td>-99%</td></tr>
<tr><td>Runways and Passenger Facilities</td><td colspan="4">• 1 runway (2,160 m)<br>• 1 passenger terminal</td></tr>
<tr><td>Nature of Traffic</td><td colspan="4">PAX: Mainly scheduled international traffic (48%).<br>Cargo: Freight steadily increasing. Mail is very low.</td></tr>
<tr><td colspan="5">Accounting Principles/Policies and Accounting Specifics<br>• 1993/94, negative operating profit.<br>• 1990/91-1995/96, almost zero or negative net profit.</td></tr>
<tr><td colspan="5">Ownership and Regulation<br>[Change in Ownership (2001)<br>• 71.4% TBI plc<br>• 28.6 % Bechtel Enterprises Holding<br><u>Partially Privatised in terms of a public private partnership (since 21 August 1998)</u><br>[considered fully privatised in terms of decision making and financial risk based on long-term concession agreement.]<br>• LTN is operated, managed and developed by a private consortium, London Luton Airport Operations (LLAO). Original LLAO consortium: Airport Group International [acquired by TBI plc in 1999], Barclays Private Equity and Bechtel. Concession agreement to develop and operate the airport for a period of 30 years. The airport shareholders, Luton Borough Council, receive an annual concession fee.]<br><u>Publicly Owned (until 1998)</u><br>• Luton Borough Council</td></tr>
<tr><td colspan="5">Major Investments in Fixed Assets<br>• During the '90s, a ten year expansion plan (233mio EUR / 170mio GBP) was implemented. The airport facilities were expanded in order to meet demand of the future.<br>• 1990, new passenger terminal opened.</td></tr>
<tr><td colspan="5">Major Financial Investments and Participations: n/a</td></tr>
<tr><td colspan="5">Extraordinary Events and Other Factors: n/a</td></tr>
</table>

Note: *[Information concerning events after the period covered in the data analysis.]*

## MAN – Manchester, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 186,620 | 23% |
| | **Terminal PAX ('000)** | 17,456 | 73% |
| | • Scheduled | 46% | 75% |
| | • International | 84% | 79% |
| | **Air Cargo (in tonnes)** | 114,895 | 45% |
| | • Air Freight | n/a | n/a |
| | • Air Mail | n/a | n/a |
| Runways and Passenger Facilities | • 2 runways (each 3,048 m)<br>• 3 passenger terminals | | |
| Nature of Traffic | PAX: Mainly non-scheduled traffic (54%).<br>Cargo: Steadily increasing. No details on freight and mail. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1999/00, number of employees increased by almost 10%, decrease in revenue and net profit.
- 1998/99, 1996/97 and 1995/96, increase in capital (ordinary shares).

**Ownership and Regulation**

*[Change in Company Structure (June 2001)*

- *Restructuring from a single company to a holding company with five trading subsidiaries: Manchester Airport Division; Manchester Airport Aviation Services; Manchester Airport Ventures; Manchester Airport Developments and Regional Airports. Manchester Airports Group (MAG) consists of Humberside, Bournemouth, East Midlands and Manchester airports.]*

MAN is subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the company's RPI-X price cap.

Publicly Owned

- 55% Council of the City of Manchester
- 5% each: Borough Council of Bolton, Borough Council of Bury, Oldham Borough Council, Rochdale Borough Council, Council of the City of Salford, Metropolitan Borough of Stockport, Tameside Metropolitan Borough Council, Trafford Borough Council and Wigan Borough Council

**Major Investments in Fixed Assets**

- *[2001, opening of second runway (268mio EUR / 172mio GBP).*
- *2000, work begins on a multi-modal ground transport interchange (545mio EUR / 350mio GBP).]*
- During the '90s, 684mio EUR (500mio GBP) were invested in two terminals, extension of the old runway and construction of a new runway and additional cargo facilities.
- 1998, passenger terminal (T3) opened.
- 1995, maintenance hanger for BA opened (32mio EUR / 27mio GBP).

**MAN – Manchester, UK (cont'd)**

| |
|---|
| **Major Investments in Fixed Assets (cont'd)**<br>• 1993, passenger terminal (T2) and railway station opened.<br>• 1989, domestic terminal opened. |
| **Major Financial Investments and Participations**<br>• *[28 March 2000, acquisition of Bournemouth and East Midlands from National Express Group (375mio EUR / 241mio GBP)]*<br>• 1999, Humberside International Airport 82.7%. |
| **Extraordinary Events and Other Factors:** n/a |

Note: *[Information concerning events after the period covered in the data analysis.]*

## MRS – Marseille, France

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 123,131 | 15% |
| | **Terminal PAX ('000)** | 5,912 | 27% |
| | • Scheduled | 94% | 28% |
| | • International | 29% | 14% |
| | **Air Cargo (in tonnes)** | 58,584 | 20% |
| | • Air Freight | 66% | 16% |
| | • Air Mail | 34% | 27% |
| Runways and Passenger Facilities | • 2 runways (3,500 m, 2,370 m)<br>• 2 passenger terminals | | |
| Nature of Traffic | PAX: Mainly scheduled domestic traffic (70%).<br>Cargo: Freight and mail volume often vary but increase. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1990-1999, negative net profit, mostly due to high tax obligation.
- Cahier des charges type applicable aux concessions d'outillage public d'aéroport aux chambres de commerce; Décret du 6 Mai 1955.
- Airside assets off balance sheet, due to concession agreement with the French Government as explained below in Ownership and Regulation.

**Ownership and Regulation**

- *[In 2000, Préfets started negotiating new concessions for the French regional airports, after Government's 1999 decision to renew the Chamber of Commerce's mandate for managing short-term concessions only, up to expected EU legislation on tendering concessions of public services. Certain airports will be transferred to local authorities. An in-depth review of the evolution of airport management has been initiated by the Direction Generale de l'Aviation Civile (DGAC), on the basis of preliminary work of the relevant bodies and proposals put forward by the Union of Chambers of Commerce and Airport Management (UCCEGA).]*

Publicly Owned

- Marseille airport is property of the French Government, conceded to the local Chamber of Commerce and Industry under a concession contract expiring in 2017 for a symbolic 152 EUR p.a. (1,000 FRF) It is the concessionaire's obligation to construct and/or develop respective facilities and to cover the running costs of the airport. Similar to a BOT project, all assets are transferred to government at the end of the concession period. In contrast to the BOT concept, however, government will also take over repayment of principal and interest under related finance agreements. In addition to that, advances – even for covering operating losses – will be repaid.

**Major Investments in Fixed Assets**

- Between 1989 and 1999, the major focus on investment was to upgrade the facilities. During this time, MRS invested 300mio EUR (2bn FRF).
- 1996-1998, the international passenger terminal was completely redeveloped.
- 1990-1995, the domestic passenger terminal was completely rebuilt.

**Major Financial Investments/Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

Note: *[Information concerning events after the period covered in the data analysis.]*

## NAP – Naples, Italy

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 56,895 | 96% |
| | **Terminal PAX ('000)** | 3,549 | 84% |
| | • Scheduled | 81% | 49% |
| | • International | 34% | 73% |
| | **Air Cargo (in tonnes)** | 4,956 | -4% |
| | • Air Freight | 63% | 9% |
| | • Air Mail | 37% | -21% |
| Runways and Passenger Facilities | • 2 runways (each 2,650 m)<br>• 2 passenger terminals | | |
| Nature of Traffic | PAX: Mainly scheduled domestic traffic (65%).<br>Cargo: Freight decreasing. Mail decreased by 52% in 1999. | | |

**Accounting Principles/Policies and Accounting Specifics**

- 1998, increase in capital.
- Since 1996, the B/S increased rapidly.
- 1994, negative operating profit. However, due to financial income and extraordinary income net profit is positive.
- 1990 and 1991, negative net profit.

**Ownership and Regulation**

Partially Privatised (1999)

- 65% BAA Italia SpA
- 12.5% each Naples Province and Naples Municipality
- 5% each S.E.A. SpA and Interporto Campano SpA

Partially Privatised (1998)

- 70% BAA Italia SpA
- 12.5% each Naples Province, Naples Municipality
- 5% S.E.A. SpA

Partially Privatised (1997) as Gesac SpA

- 70% BAA Italia Srl
- 12.5% each Naples Province, Naples Municipality
- 5% SEA SpA

(On 1.8.97, Naples Province and Naples Municipality sold 35% of their shares to BAA Italia Srl., Naples and on 23.12.97, the former shareholder AVIOFIN Spa sold its holding of 5% shares to SEA SpA, Milan.)

Publicly Owned (until 1997)

- 47.5% each Naples Province, Naples Municipality
- 5% AVIONFIN Spa S.E.A.

**Major Investments in Fixed Assets**

- *[2001, midway of a 20 year investment master plan. Currently a new cargo terminal is built and the passenger halls are extended (10mio EUR).]*
- Since 1995, further investments were made into new parking facilities and in upgrading existing facilities.
- 1995, acquisition of Terminal 2 building.
- 1990, new cargo facilities opened.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors:** n/a

Note: *[Information concerning events after the period covered in the data analysis.]*

## NCL – Newcastle, UK

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 80,808 | 31% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 2,966<br>49%<br>69% | 94%<br>96%<br>113% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 4,172<br>20%<br>80% | 24%<br>-2%<br>34% |
| Runways and Passenger Facilities | • 1 runway (2,332 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly non-scheduled traffic (50%).<br>Cargo: Freight decreasing. Until 1999, mail increasing; in 1999 decreasing. | | |

**Accounting Principles/Policies and Accounting Specifics:** n/a

**Ownership and Regulation**

*[Public private partnership was established (2001)*

- *49% Copenhagen Airports*
- *51% seven local authorities]*

Publicly Owned (until 2001)

- Durham County Council, Gateshead MBC, City of Newcastle, North Tyneside MBC, Northumberland County Council, South Tyneside MBC and Sunderland City

**Major Investments in Fixed Assets**

- *[2000, extended terminal and new parking spaces opened.]*
- 1994, extended terminal and new parking spaces opened.
- 1992, additional check-in desks opened and further investments, e.g. fire station, were made (2.2mio EUR / 1.7mio GBP).
- 1991, metro extension opened.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Other Factors**

24 hours operation.

Note: *[Information concerning events after the period covered in the data analysis.]*

## RIA – AerRianta Group, Ireland

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| **Dublin (DUB)** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movements** | 170,421 | 39% |
| | **Terminal PAX ('000)** | 12,657 | 131% |
| | • Scheduled | 87% | 128% |
| | • International | 95% | 139% |
| | **Air Cargo (in tonnes)** | 112,124 | 124% |
| | • Air Freight | 92% | 123% |
| | • Air Mail | 8% | 141% |
| **Shannon (SNN)** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movements** | 51,414 | -14% |
| | **Terminal PAX ('000)** | 1,646 | 76% |
| | • Scheduled | 85% | n/a |
| | • International | 89% | 85% |
| | **Air Cargo (in tonnes)** | 34,714 | 70% |
| | • Air Freight | 99% | n/a |
| | • Air Mail | 1% | n/a |
| **Cork (ORK)** | | Total 1999 | Growth 90 – 99 |
| Airport Size | **Aircraft Movements** | 43,113 | -33% |
| | **Terminal PAX ('000)** | 1,478 | 118% |
| | • Scheduled | 85% | n/a |
| | • International | 82% | 141% |
| | **Air Cargo (in tonnes)** | 11,723 | 476% |
| | • Air Freight | 64% | n/a |
| | • Air Mail | 36% | n/a |
| Runways and Passenger Facilities | **Dublin (DUB)**<br>• 3 runways (2,637 m, 2,073 m, 1,356 m)<br>• 1 passenger terminal<br>**Shannon (SNN)**<br>• 2 runways (3,200 m, 1,720 m)<br>• 1 passenger terminal<br>**Cork (ORK)**<br>• 2 runways (2,133 m, 1,310 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | **Dublin (DUB)**<br>PAX: Mainly scheduled international traffic (82%).<br>Cargo: Freight and mail are steadily increasing.<br>**Shannon (SNN)**<br>PAX: Mainly scheduled international traffic (75%).<br>Cargo: Freight and mail are steadily increasing.<br>**Cork (ORK)**<br>PAX: Mainly scheduled international traffic (68%).<br>Cargo: Fast increasing cargo services. | | |

## RIA – AerRianta Group, Ireland (cont'd)

**Accounting Principles/Policies and Accounting Specifics**

- 1 Jan 1999, ownership of all airport assets (DUB, SNN, ORK) transferred by the Minister for Public Enterprise to AerRianta. The company issued 146,721,889 ordinary shares of 1.3 EUR (1 IEP) each to the Minister for Finance and cancelled its existing 51,000 shares to give effect to the Air Navigation and Transport Act, 1998, which required the issuance of fully paid up shares equivalent to the net assets of the company on vesting day.
- Until 1 Jan 1999, the parent company did not have to pay any Irish corporate tax. Therefore, in 1999 taxes rose by 250%.
- 1999, very high investment.
- 1999 and 1998, no details on income are published.
- Since 1997, assets increase sharply.

**Ownership and Regulation**

Publicly Owned

- Ministry for Tourist, Transport and Communications

**Major Investments in Fixed Assets**

- **DUB**
  2000, completion of expanding and upgrading of facilities which almost doubles the public area (381mio EUR / 370mio IEP).
  1989, new 8,650 foot runway and a new air traffic control centre were completed.
- **SNN**
  *[2000, opening of a new passenger terminal which doubles the passenger handling capacity.]*
- **ORK**
  Between 1993-1998, in a four phase programme the terminal building has almost trebled the size, to cater 1 mio passengers. 1998, start of expansion and improvement of cargo facilities as well as the construction and development of a new business park.
  11/1995, new freight terminal, warehousing, office space.

**Major Financial Investments and Participations**

- *[2000, HAM together with HochTief]*
- 1997, DUS (50%) together with HochTief
- 1996, BHX (40%) together with NatWest Ventures
- Duty-Free Operations in the Middle East, Channel Tunnel

**Extraordinary Events and Other Factors**

- Core business: Airport operations and duty-free retailing.
- AerRianta Group includes DUB, SNN and ORK.
- **ORK**: Since 1999, 24-hours airport operation.

Note: *[Information concerning events after the period covered in the data analysis.]*

**STN – Stansted, UK**

| | | | |
|---|---|---|---|
| Period Covered | 1 April 1990 – 31 March 2000 | | |
| Airport Size | | Total 1999/2000 | Growth 1990/91 – 1999/00 |
| | **Aircraft Movements** | 158,600 | 258% |
| | **Terminal PAX ('000)** | 10,024 | 731% |
| | • Scheduled | 86% | 1,996% |
| | • International | 84% | 761% |
| | **Air Cargo (in tonnes)** | 184,154 | 448% |
| | • Air Freight | 92% | 418% |
| | • Air Mail | 8% | 1,684% |
| Runways and Passenger Facilities | • 1 runway (3,048 m)<br>• 1 passenger terminal | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (71%).<br>Cargo: Freight steadily increases. 1998/99 produced an extreme increase of 42%. Mail is steadily increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- P&L data: 1991/92-1997/98, negative net profit. 1990/91-1995/96, negative operating profit. 1990/91-1997/98, high tax income returns.
- In 1996/97, increase in capital (ordinary shares).
- 1990/91, extremely high investment.
- 1988/89 and 1989/90, increase in capital (ordinary shares).
- On 31 July 1986, the main airport assets were transferred from the British Airports Authority (BAA).

**Ownership and Regulation**

Owned by BAA plc, whose stock is privately owned since 1987.

BAA's London airports LGW, LHR and STN are subject to economic regulation under the Airports Act of 1986, to protect against unreasonable conduct by the airport operator. The principal regulatory body is the Civil Aviation Authority (CAA). Under the existing regime, the Competition Commission (CC) [formerly Monopolies and Mergers Commission (MMC)] is responsible for undertaking periodic reviews of the respective RPI-X price caps.

**Major Investments in Fixed Assets**

- *[In 2002, start of a 320mio EUR (200mio GBP) project to develop STN to a capacity of 15mio passengers.]*
- 1996/97, a new cargo and passenger terminal opened (512mio EUR / 400mio GBP).
- 1994, satellite building for domestic passengers opened.
- 1991, terminal, apron and taxiways opened (569mio EUR / 400mio GBP).
- April 1986, start of a major investment programme to develop Stansted airport. This included roads, railway, terminal.

**Major Financial Investments and Participations:** n/a

**Extraordinary Events and Others Factors:**

1999, approval to increase air transport movements from 120,000 to 185,000 per year.

Note: *[Information concerning events after the period covered in the data analysis.]*

## VIE – Vienna, Austria

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 191,742 | 74% |
| | **Terminal PAX ('000)**<br>• Scheduled<br>• International | 11,066<br>88%<br>96% | 102%<br>118%<br>103% |
| | **Air Cargo (in tonnes)**<br>• Air Freight<br>• Air Mail | 125,585<br>94%<br>6% | 95%<br>105%<br>4% |
| Runways and Passenger Facilities | • 2 runways (3,600 m, 3,000 m)<br>• 1 terminal in a "one roof concept", including four terminals | | |
| Nature of Traffic | PAX: Mainly scheduled international traffic (83%).<br>Cargo: Freight steadily increases. Mail varies over time but increases. | | |

**Accounting Principles/Policies and Accounting Specifics**

- Until 1996, high investment activities.
- 1995, increase in capital (secondary offering).
- 1993, taxes were very low due to revaluation of average tax rate on tax provisions. Therefore, net profit was higher than operating profit.
- 1992, increase in capital (IPO).

**Ownership and Regulation**

*[Change in Ownership Structure (2001)*

- *50% Private Shareholders*
- *20% Province of Lower Austria*
- *20% City of Vienna*
- *10% Employee foundation]*

Change in Ownership (1995, Secondary Offering, 21% of shares)

- 1% Amsterdam Airport
- 48% Private Shareholders
- 17% Federal Republic of Austria (-8.8% Oel AG)
- 17% Province of Lower Austria
- 17% City of Vienna

Partially Privatised (1992, IPO, 27% of shares were floated)

- 27% Private Shareholders
- 18% Federal Republic of Austria
- 18% Province of Lower Austria
- 37% City of Vienna

Publicly Owned (until 1992)

- 25% Federal Republic of Austria
- 25% Province of Lower Austria
- 50% City of Vienna

**Major Investments in Fixed Assets**

- *[Masterplan 2015 plans investments most importantly the expansion of the terminals and a new runway.]*
- 1996, passenger terminal extension opened.
- 1990-1995, continuous investment into existing facilities and equipment.

**VIE – Vienna, Austria (cont'd)**

| **Major Financial Investments and Participations** |
|---|
| • *[2001, VIE joins CRA Consortium (18.7%) to construct a new airport near Ciudad Real, Spain*<br>• *Malta]* |
| **Extraordinary Events and Other Factors** |
| Provides ground handling service. |

Note: *[Information concerning events after the period covered in the data analysis.]*

## ZRH – Zurich, Switzerland

| | | | |
|---|---|---|---|
| Period Covered | 1 January 1990 – 31 December 1999 | | |
| Airport Size | | Total 1999 | Growth 90 – 99 |
| | **Aircraft Movements** | 306,182 | 40% |
| | **Terminal PAX ('000)** | 20,693 | 62% |
| | • Scheduled | 90% | 67% |
| | • International | 94% | 61% |
| | **Air Cargo (in tonnes)** | 378,449 | 40% |
| | • Air Freight | 94% | 40% |
| | • Air Mail | 6% | 39% |
| Runways and Passenger Facilities | • 3 runways (3,700 m, 3,300 m, 2,500 m)<br>• 2 passenger terminal | | |
| Nature of Traffic | Hub airport<br>PAX: Mainly scheduled international traffic (84%).<br>Cargo: Freight and mail are steadily increasing. | | |

**Accounting Principles/Policies and Accounting Specifics**

- ZRH does not pay any taxes.
- 1991, negative net profit.

**Ownership and Regulation**

*[Partially Privatised (2000, as Unique Flughafen Zurich AG)*

- *Initially, 22% of shares were floated in November 2000, after a secondary offering; subsequently, additional public placements of shares originally held by the Canton of Zurich after Unique had been granted a further 50 year concession to run Zurich airport in 2001. The Canton is committed to continuing at least a 33% stake of the share capital, while the remainder of the share issue is in free float.*
- *As the first step of privatisation the business activities of Zurich Airport Authority (ZAA) and the Airport Real Estate Company in mixed ownership, FIG, had been merged.]*

Publicly Owned

- Airport Authority of Zurich, ZAA, 100% Canton of Zurich
- Airport Real Estate Company, FIG, 50% Canton, City of Zurich and other public sector shareholders, 50% private shareholders

**Major Investments in Fixed Assets**

- Airport 2000 was a major investment programme (1.4bn EUR / 2bn CHF) to upgrade the entire airport. The most important investments include new taxiways, a midfield passenger terminal, railway connection and extension of the cargo centre.
- In the 1980s, the last major investment programme has been undertaken. Since then, the focus was on extending and modifying the existing facilities.

**Major Financial Investments and Participations**

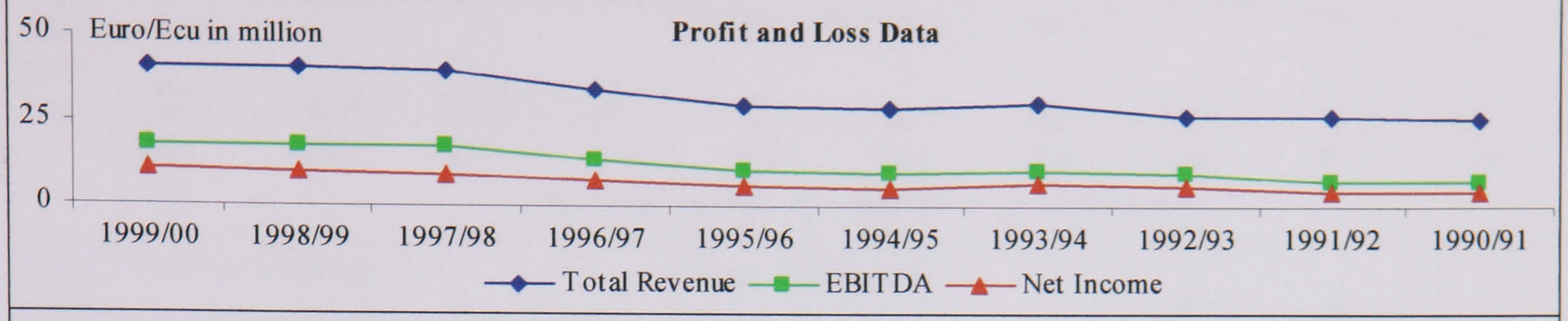
- *[Bangalore, India]*

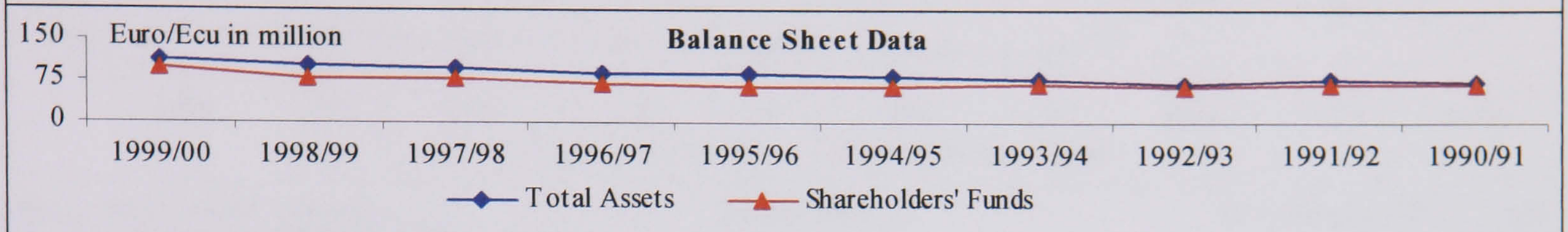
**Extraordinary Events and Other Factors:** n/a

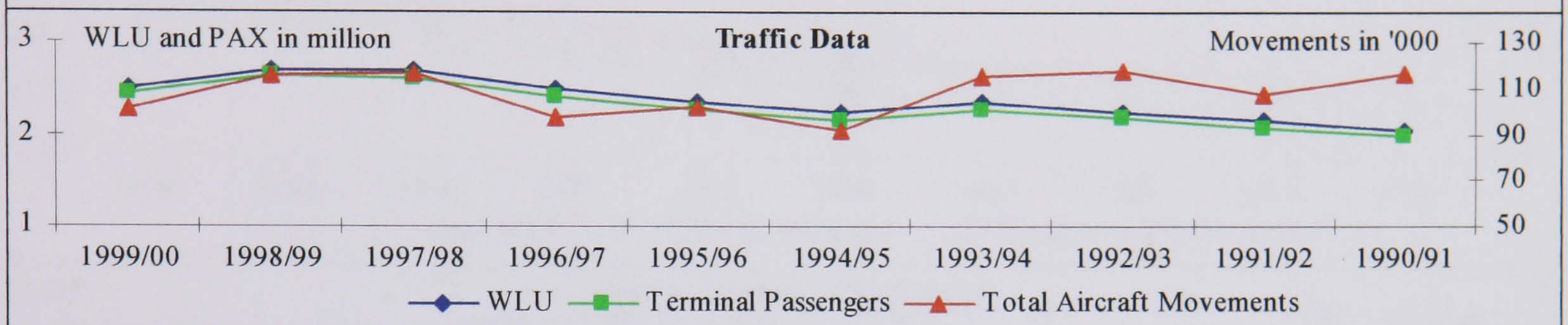
Note: *[Information concerning events after the period covered in the data analysis.]*

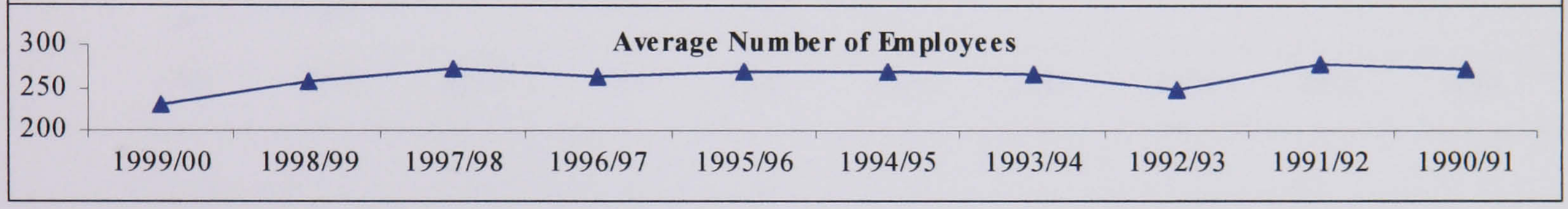
# Appendix B.2: Summary of Key Data

## ABZ – Aberdeen, UK

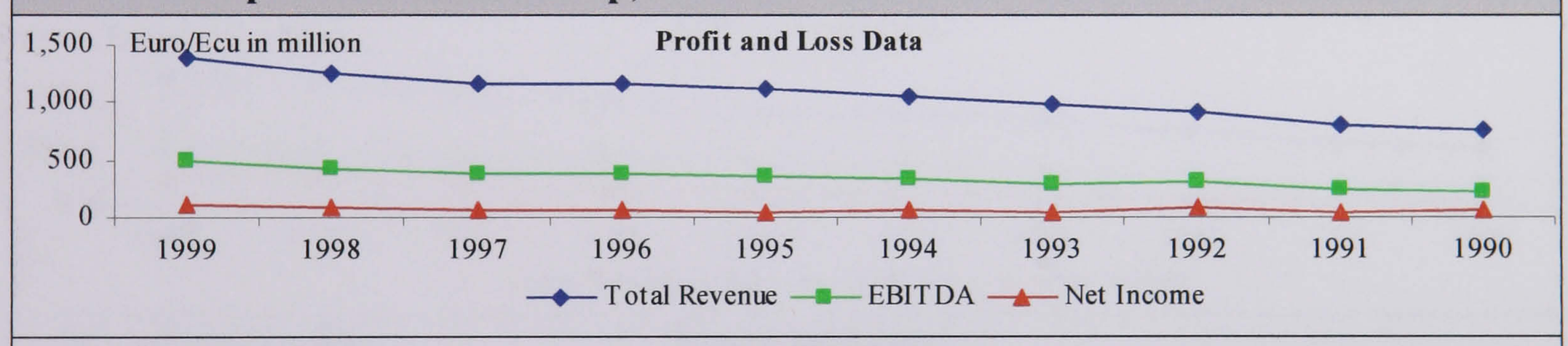


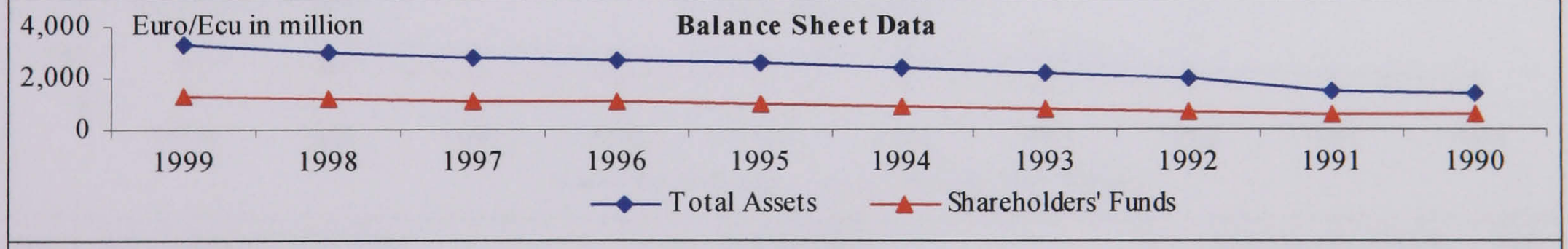



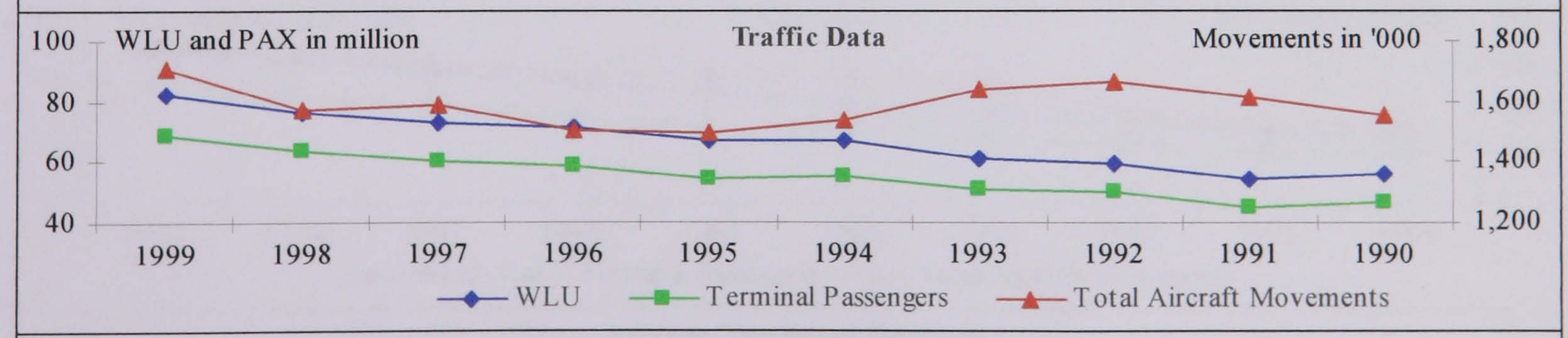



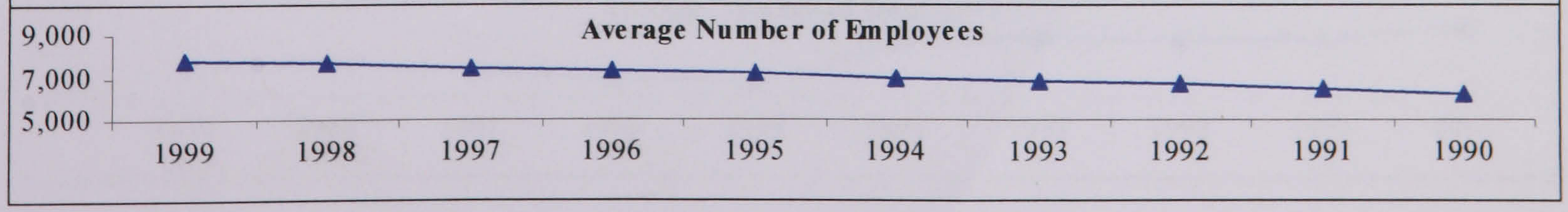




## ADP – Aeroports de Paris Group, France

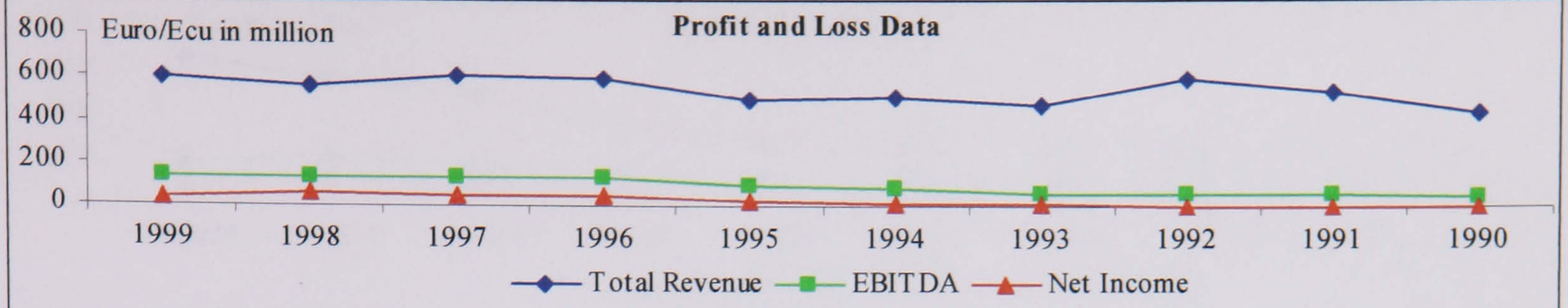


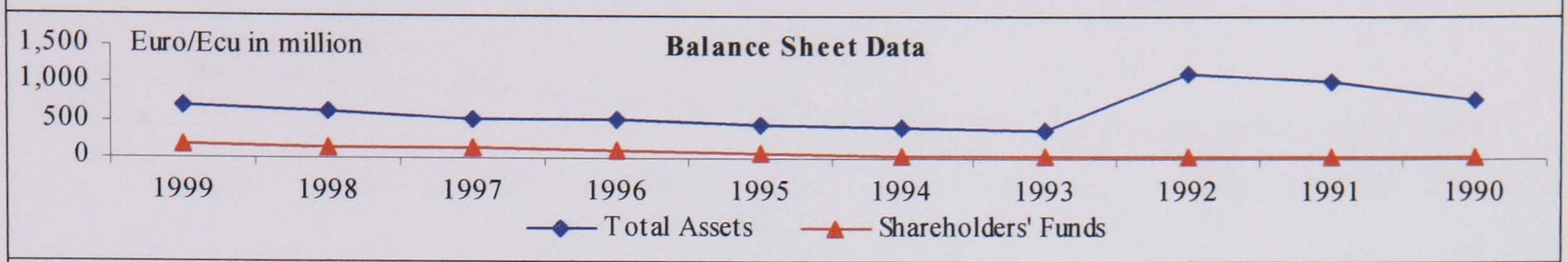



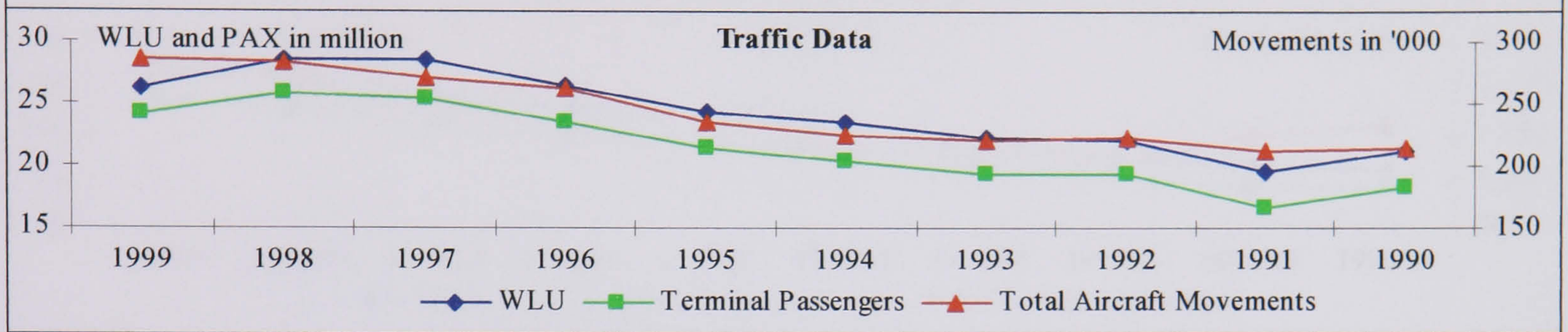



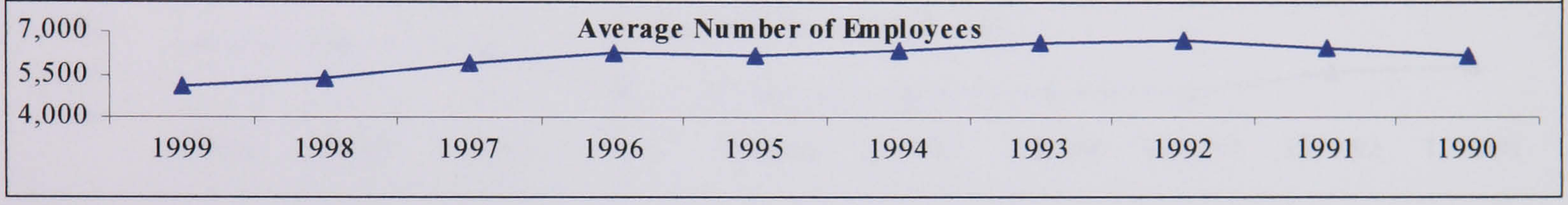



## ADR – Aeroporti di Roma, Italy

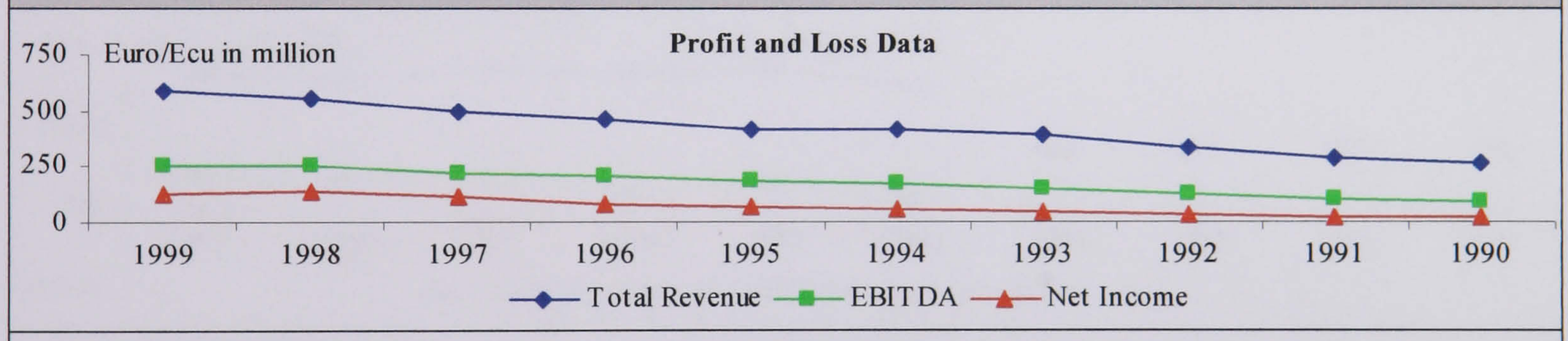


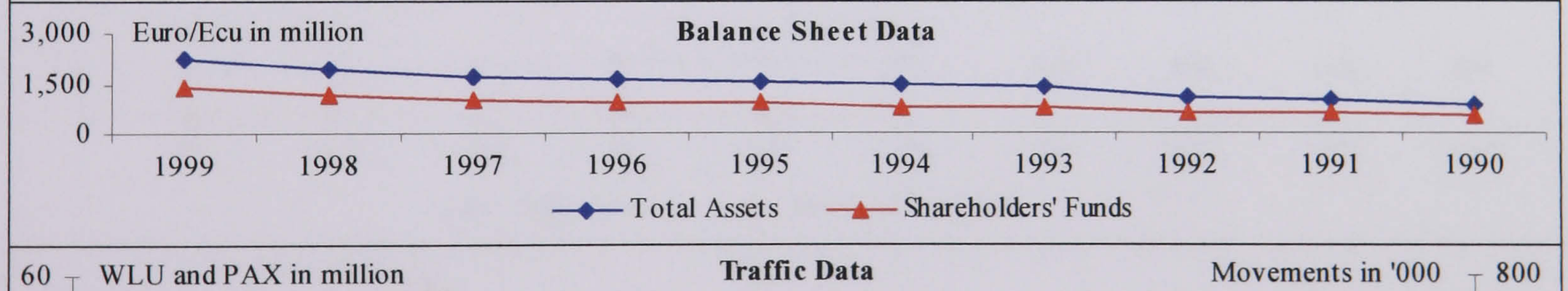



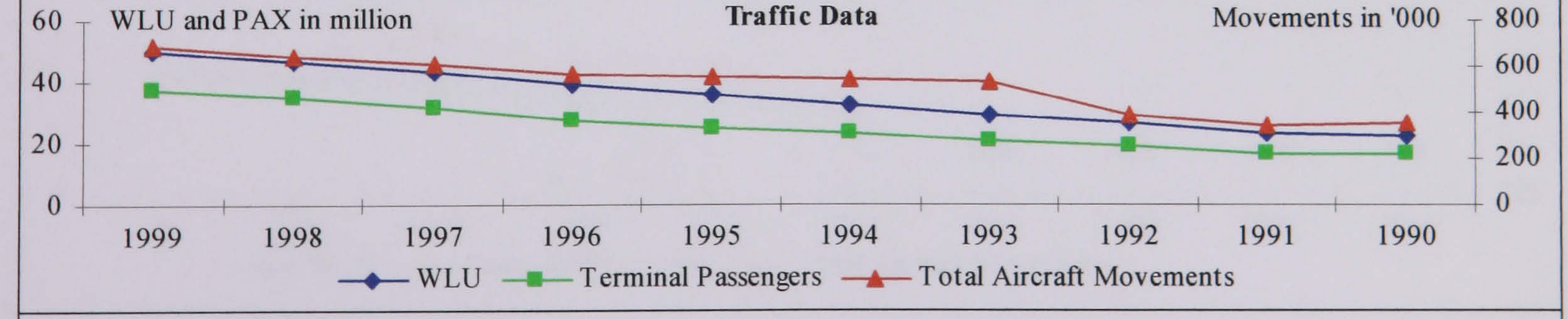



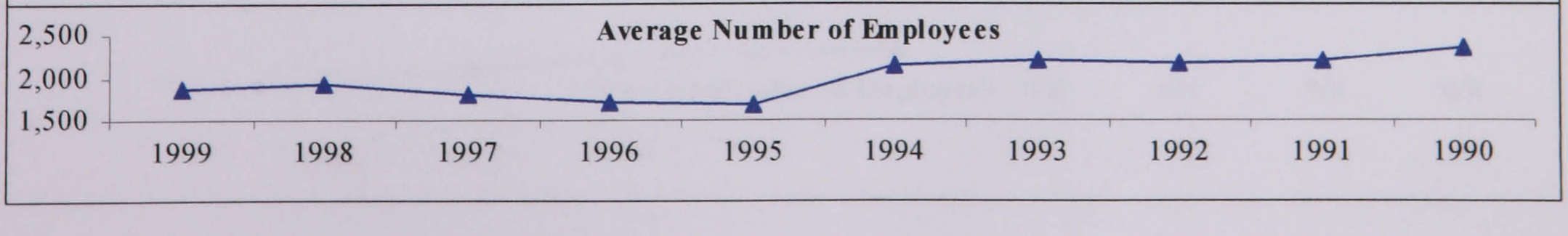




## AMS – Schiphol Group (Amsterdam), Netherlands

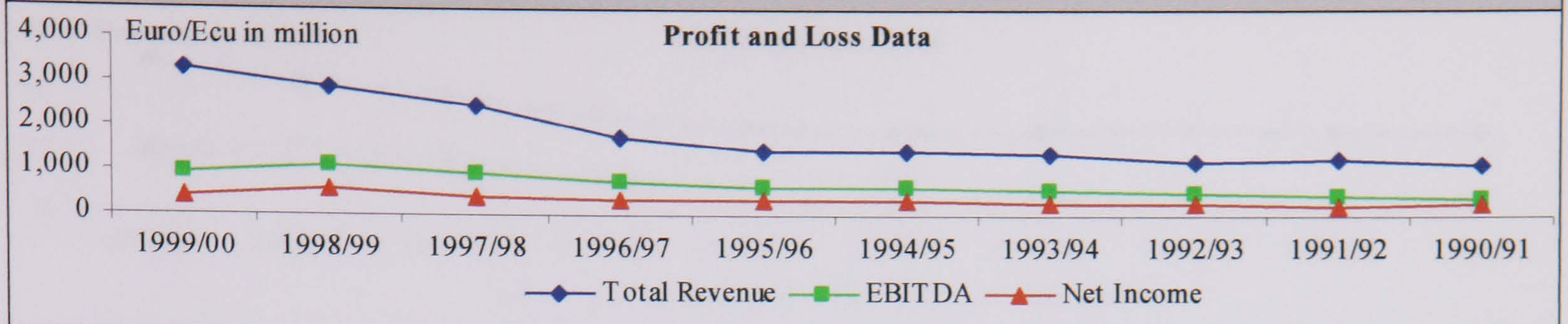


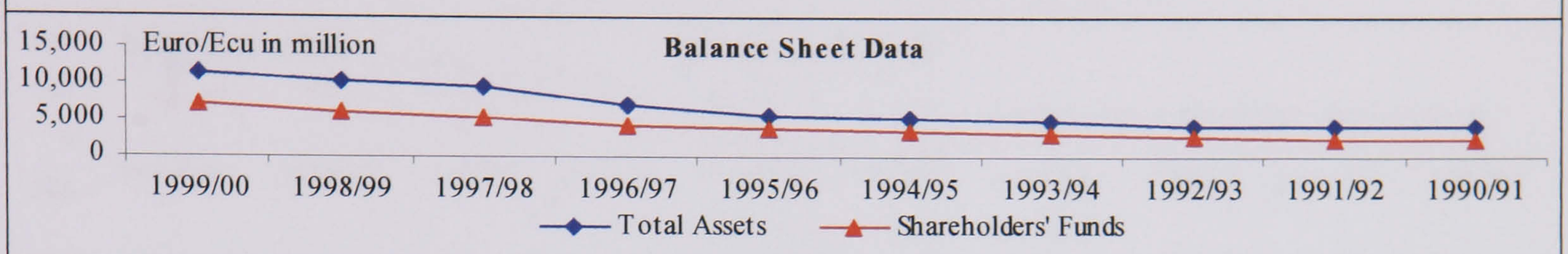



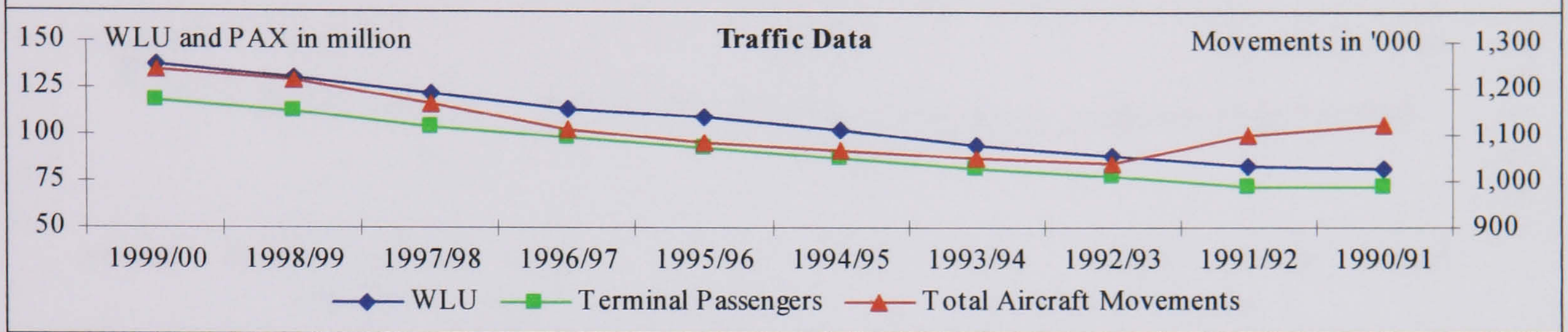



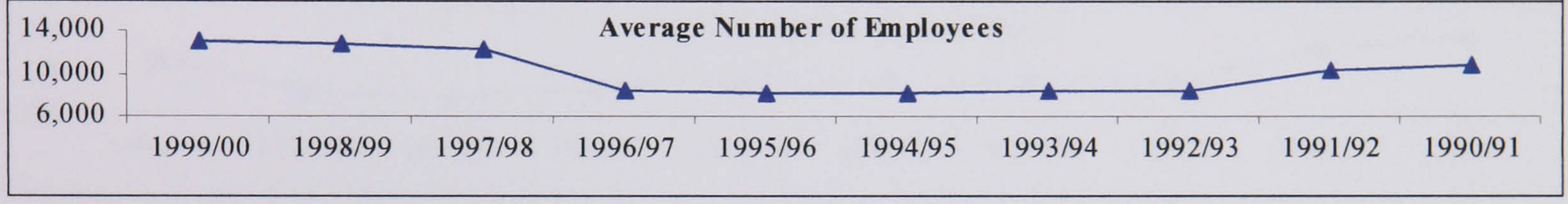



## BAA – BAA Group, UK

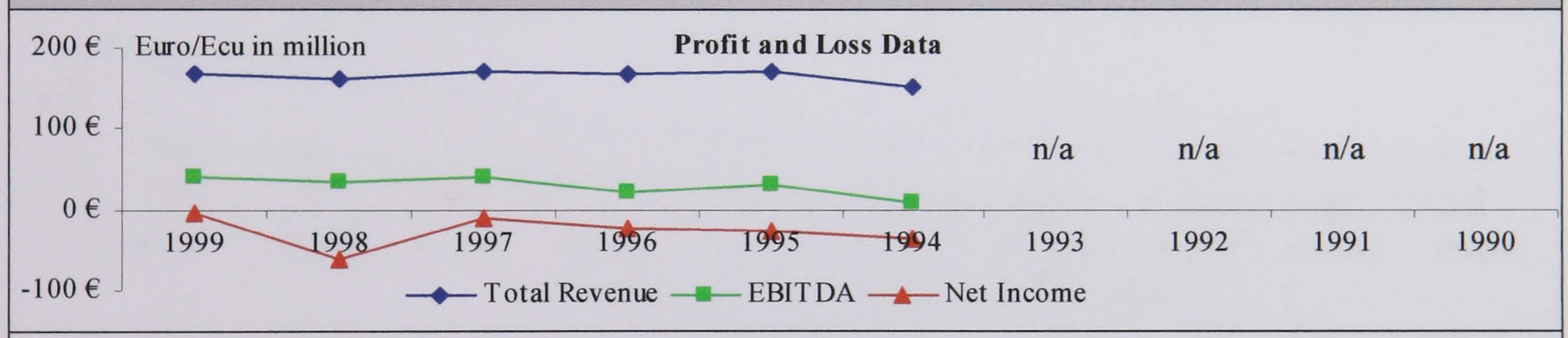


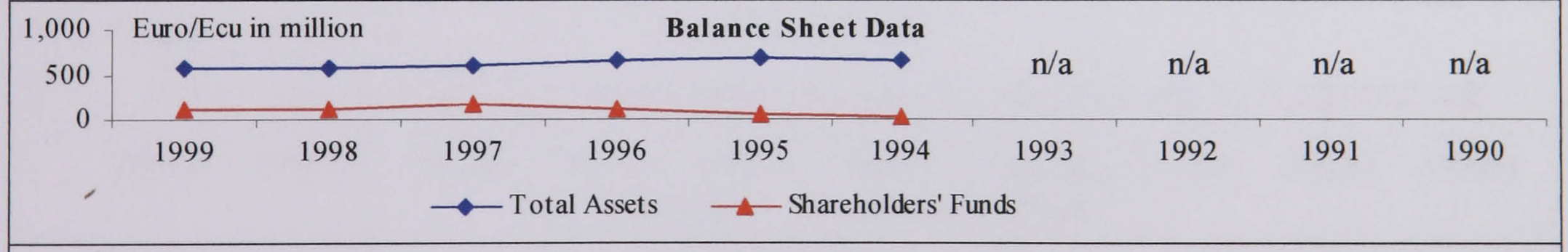



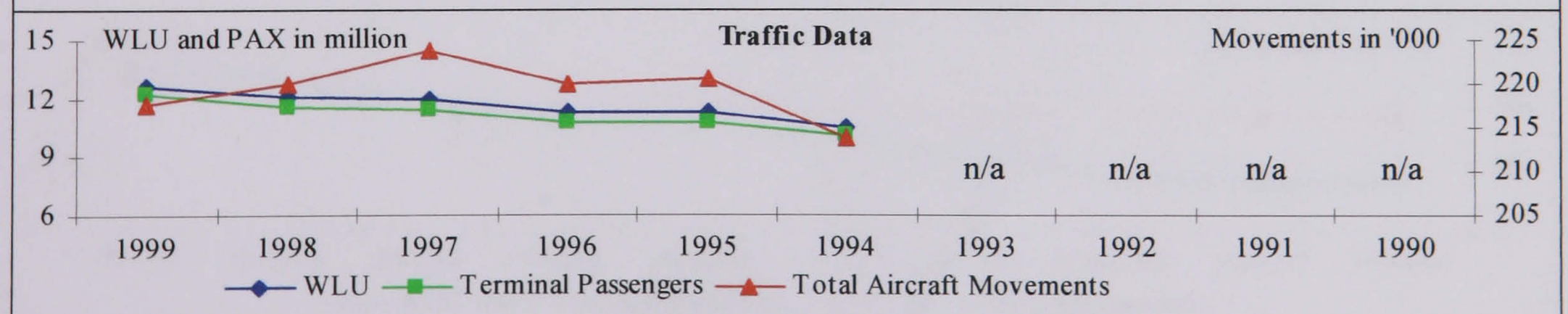



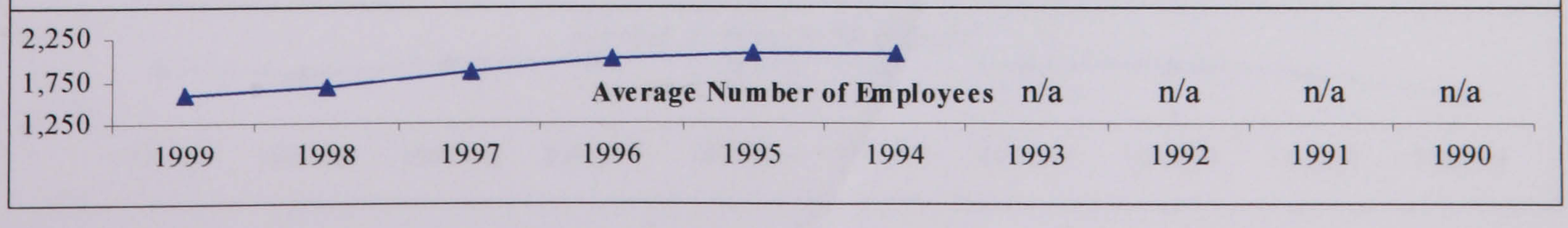




## BER – Berlin Group, Germany

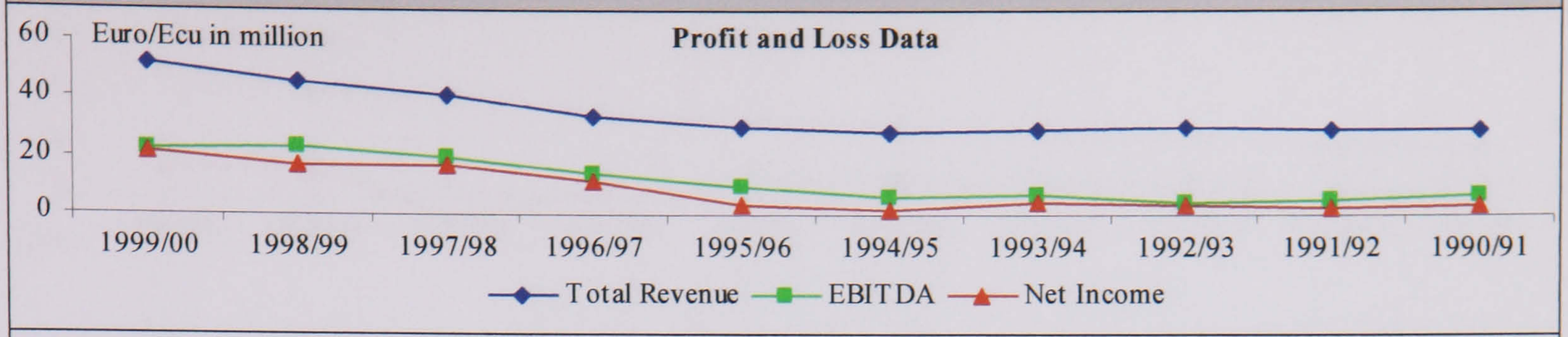


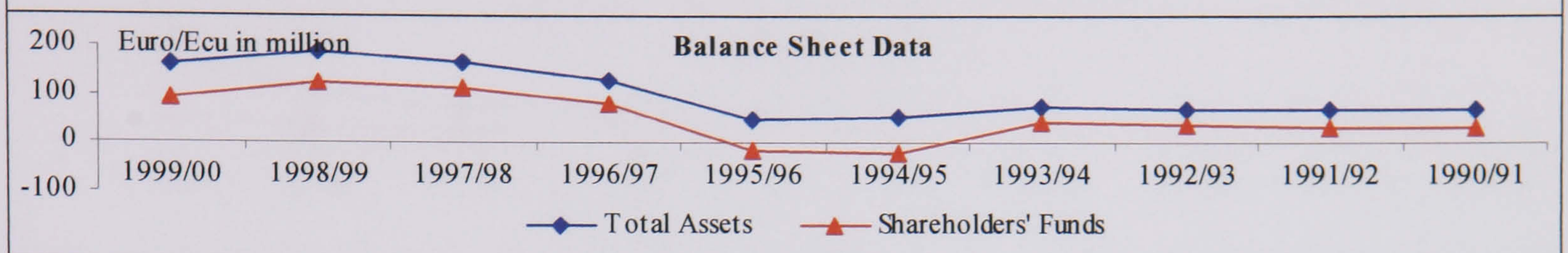



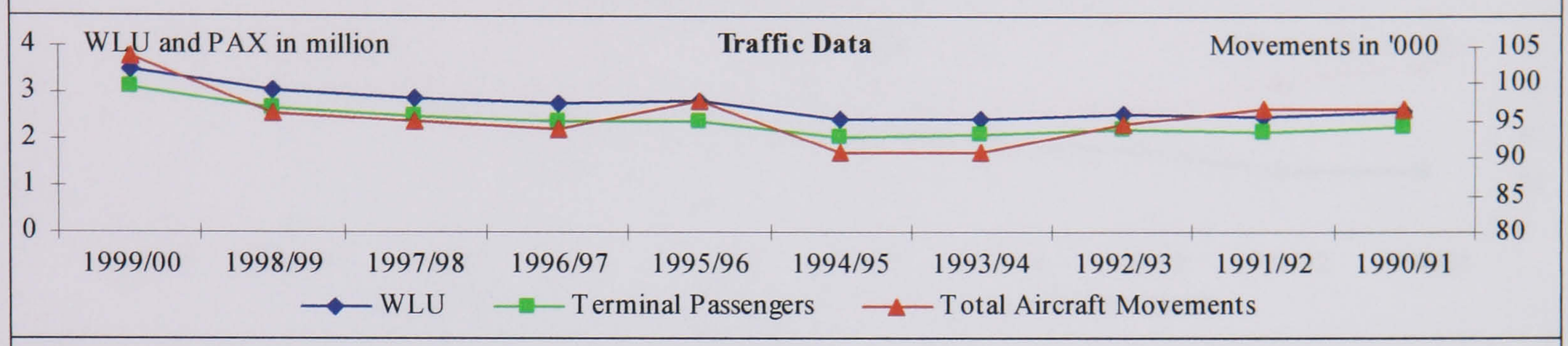



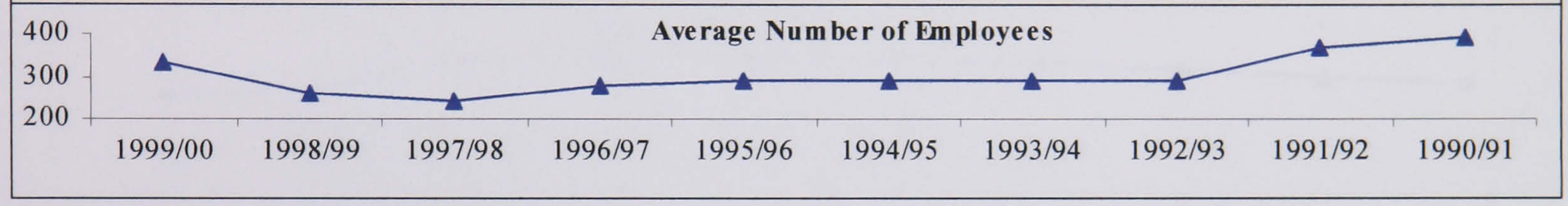



## BFS – Belfast, UK

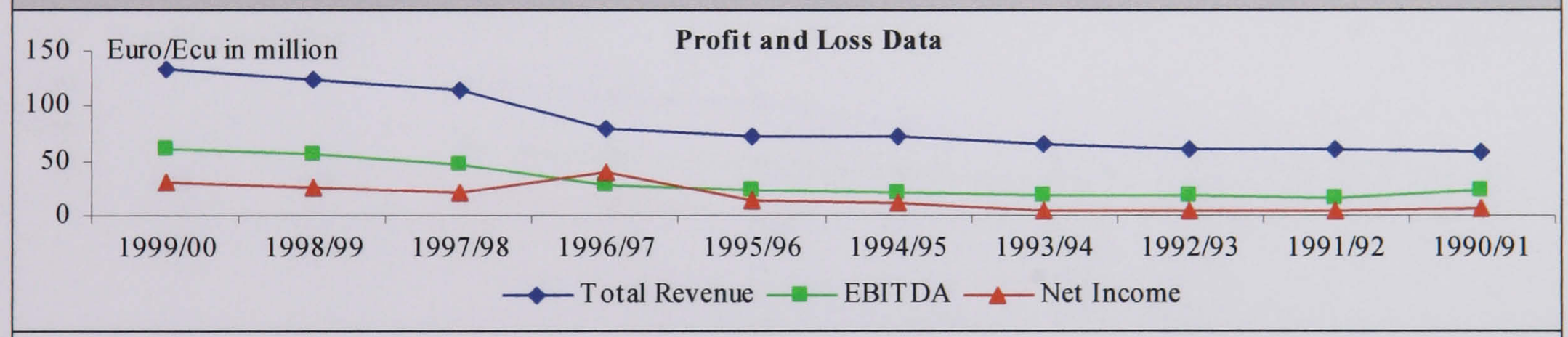


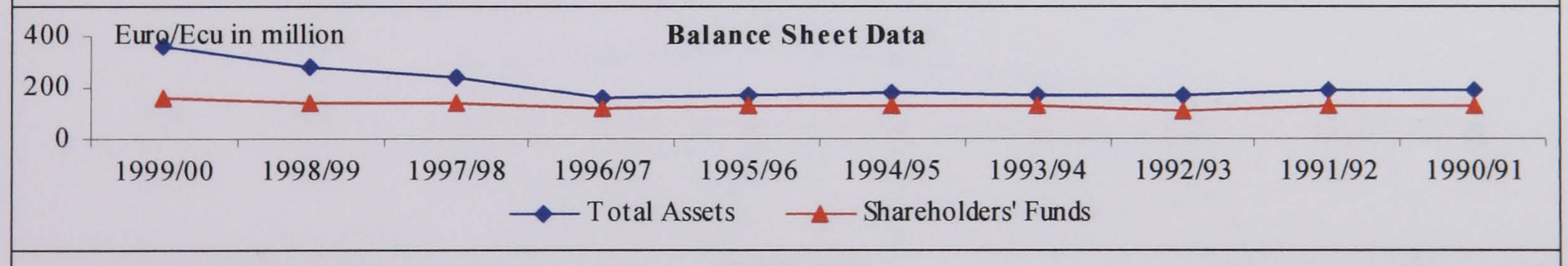



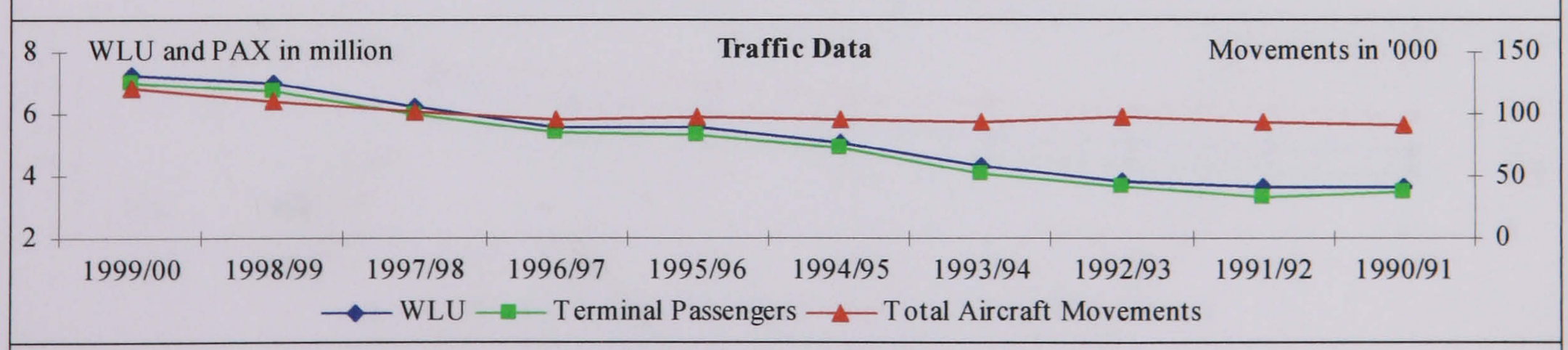



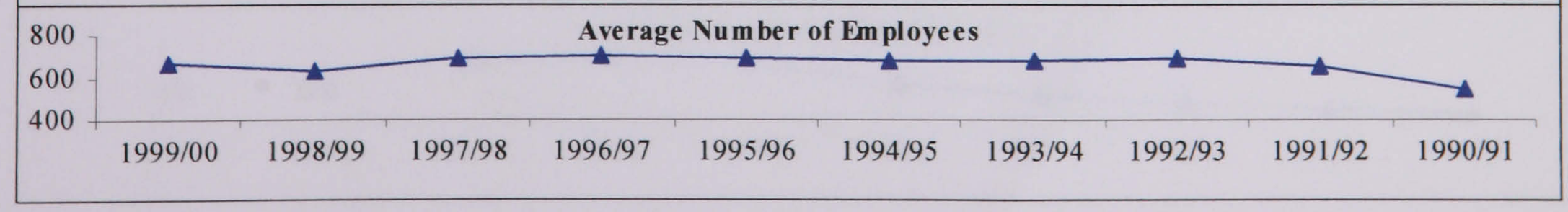




## BHX – Birmingham, UK

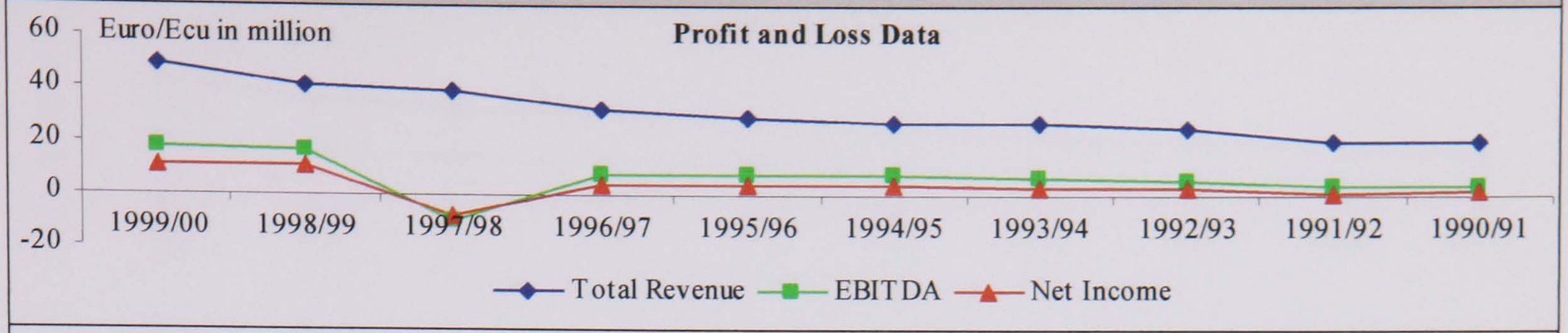


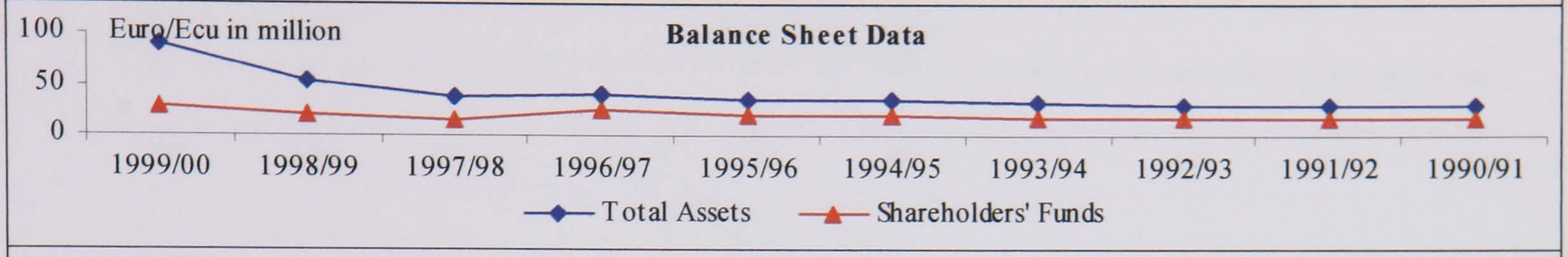



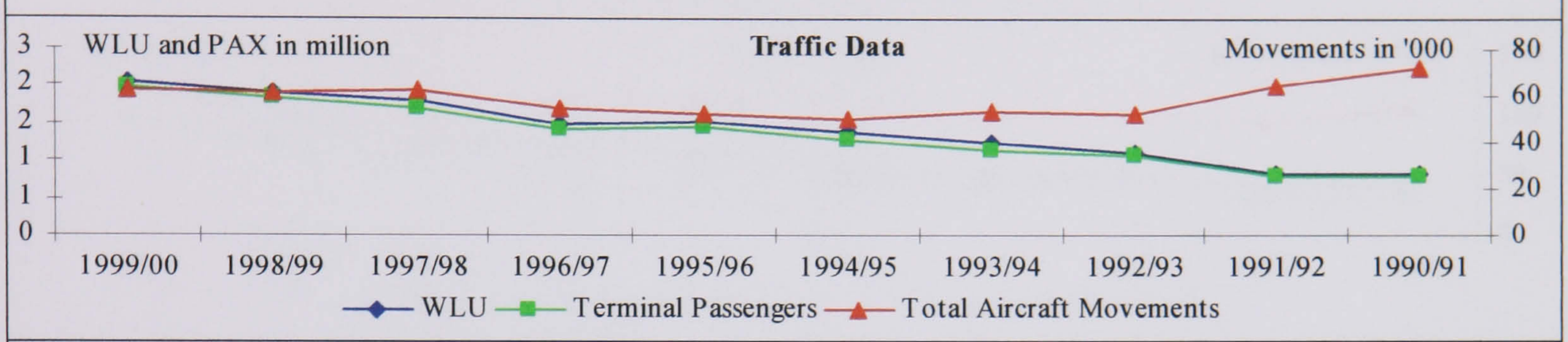



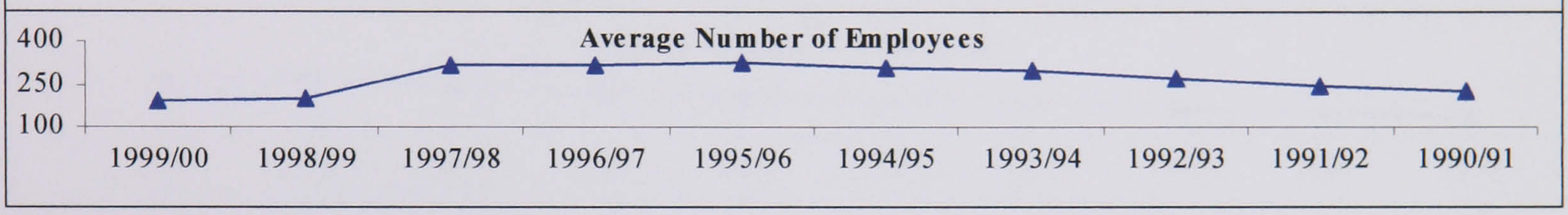



## BRS – Bristol, UK

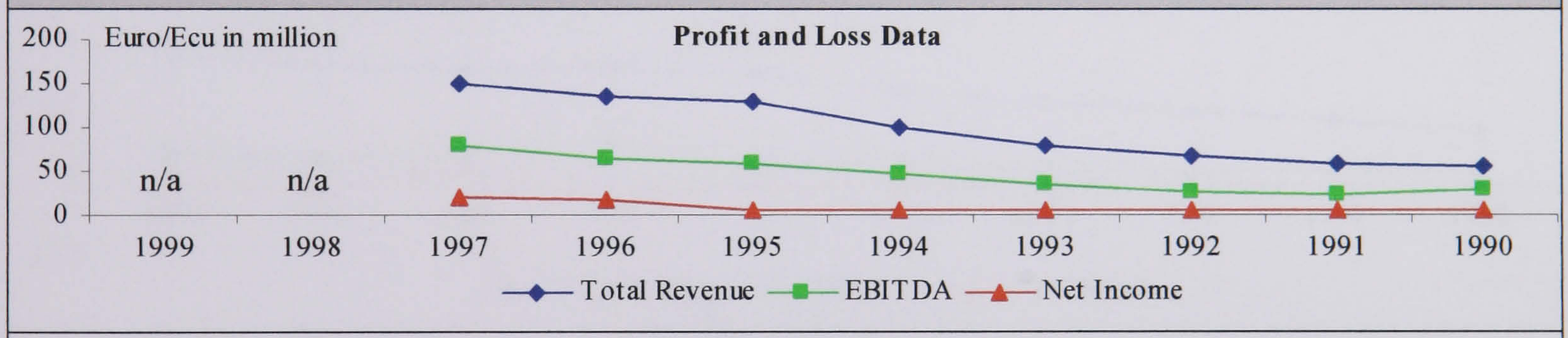


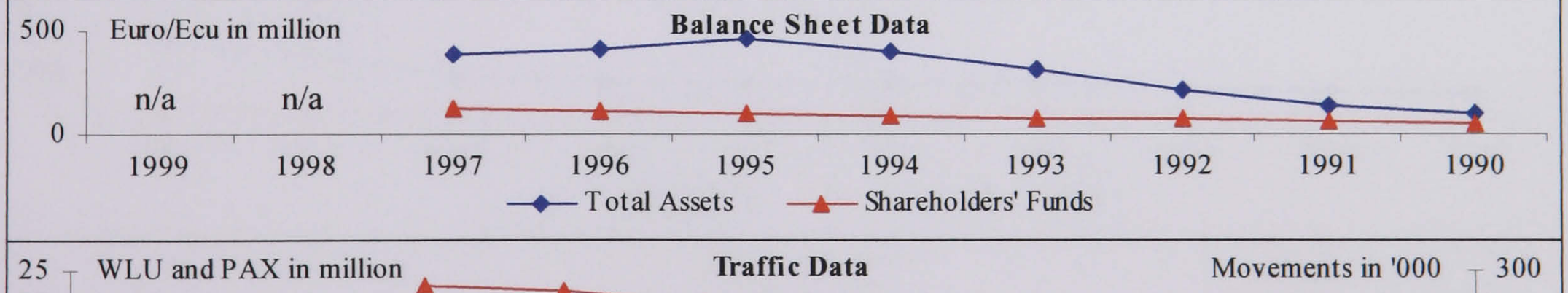



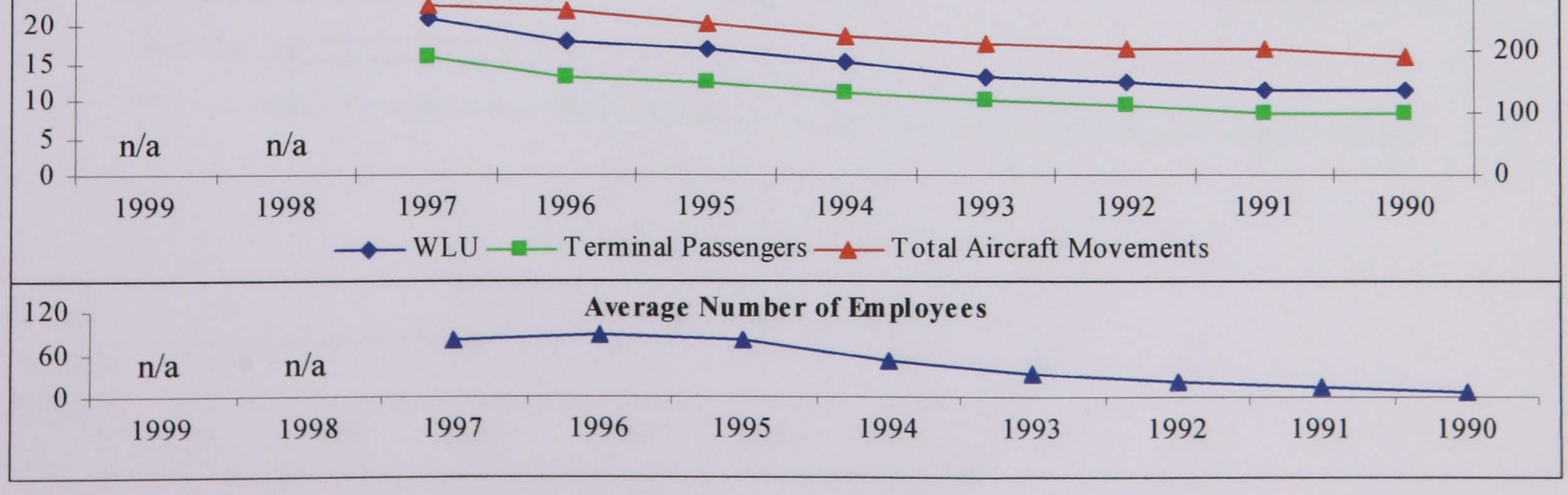



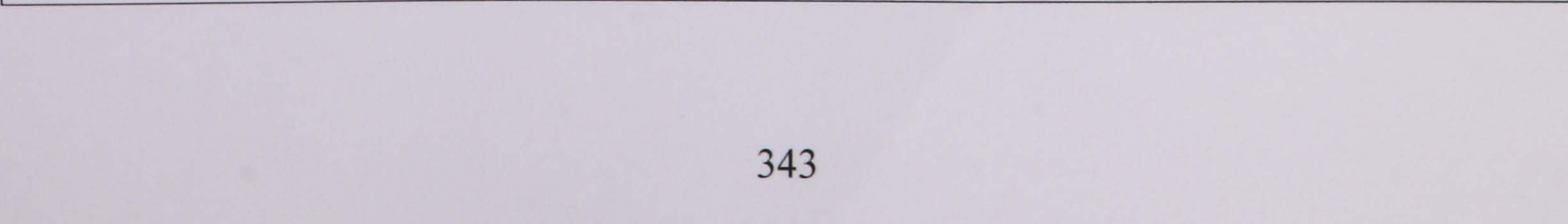




## BRU – Brussels, Belgium

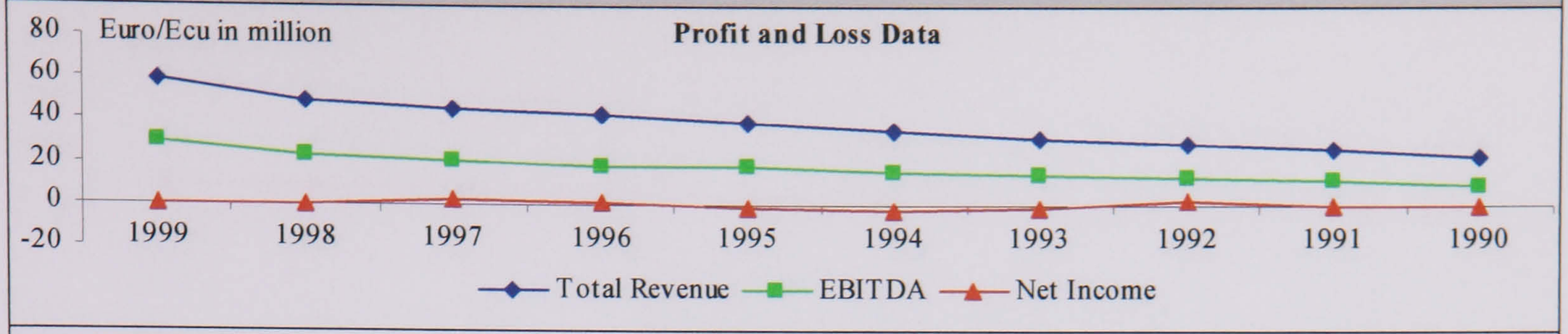


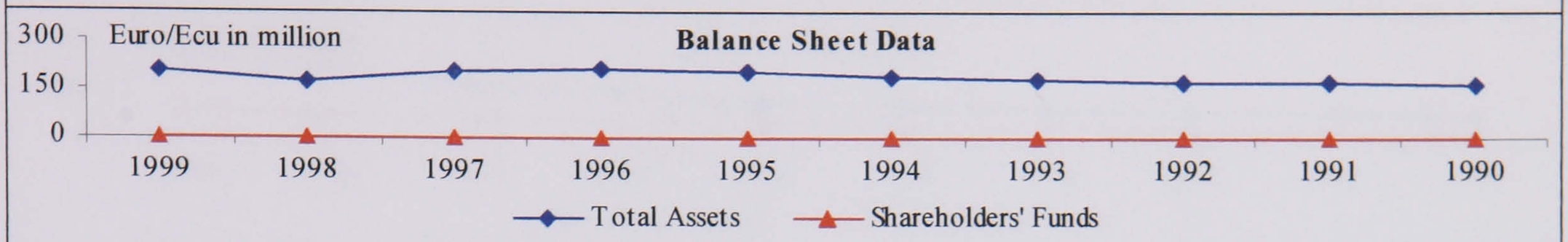



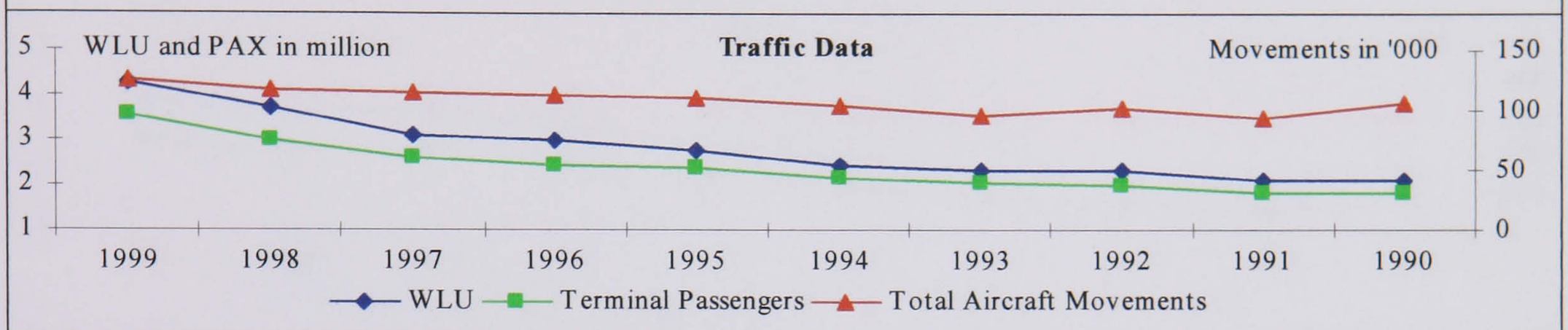



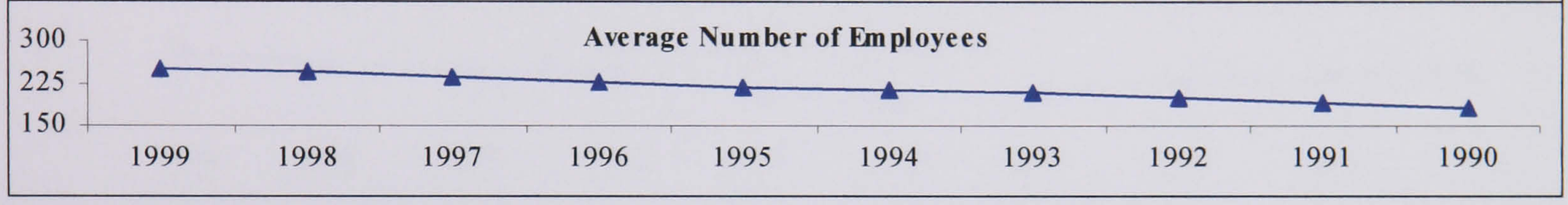



## BSL – Basel Mulhouse, Switzerland/France

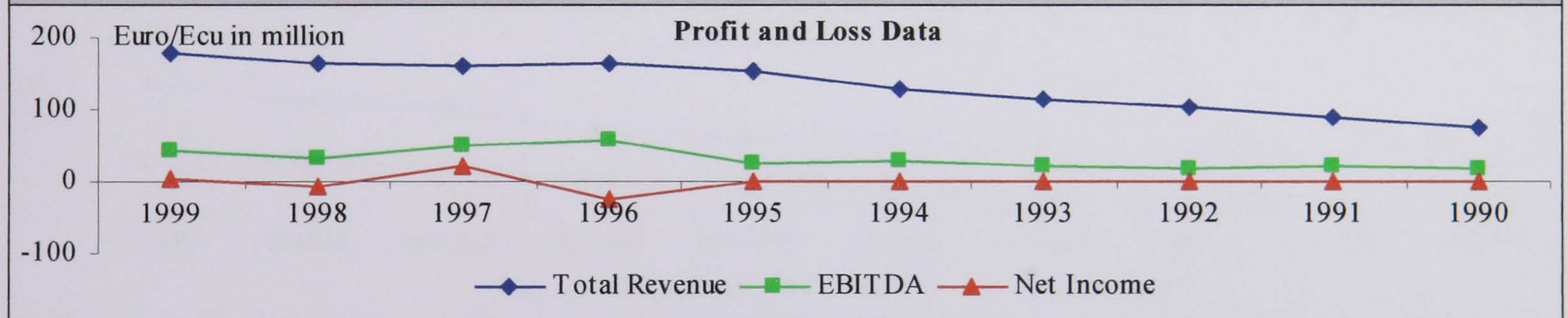


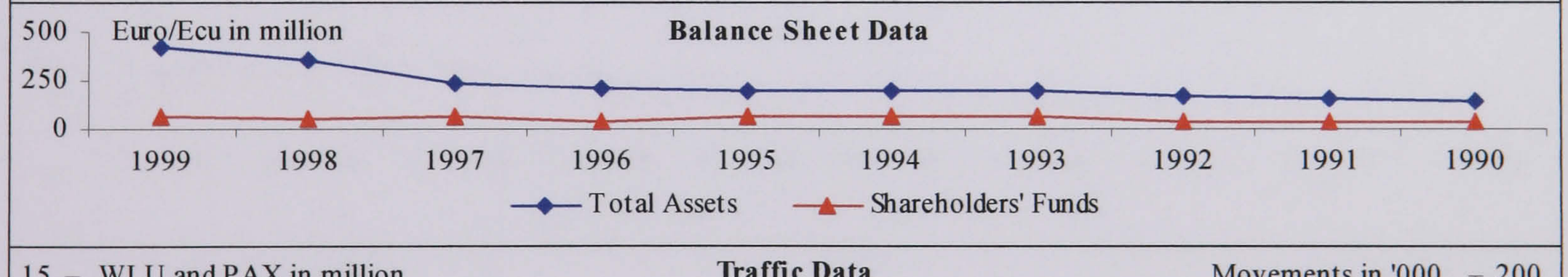



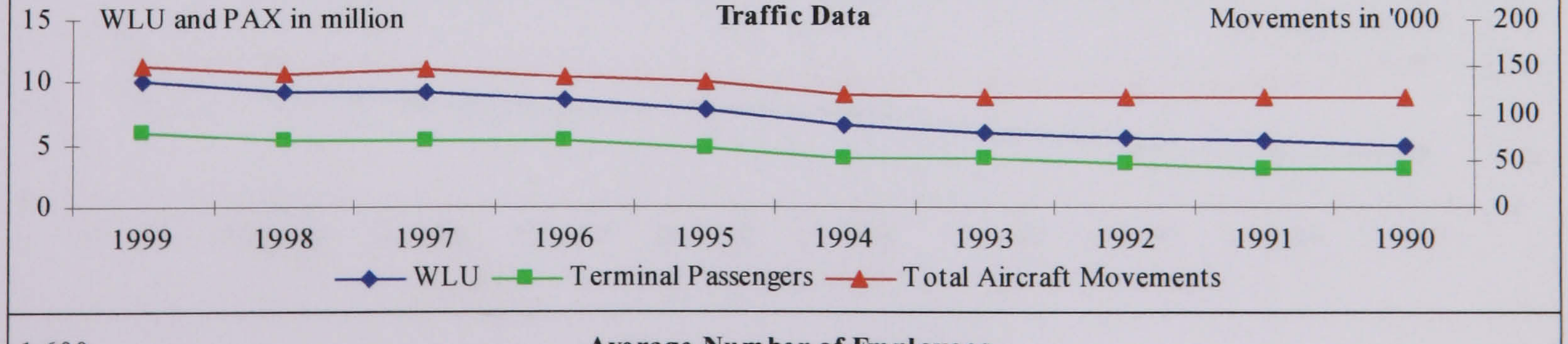



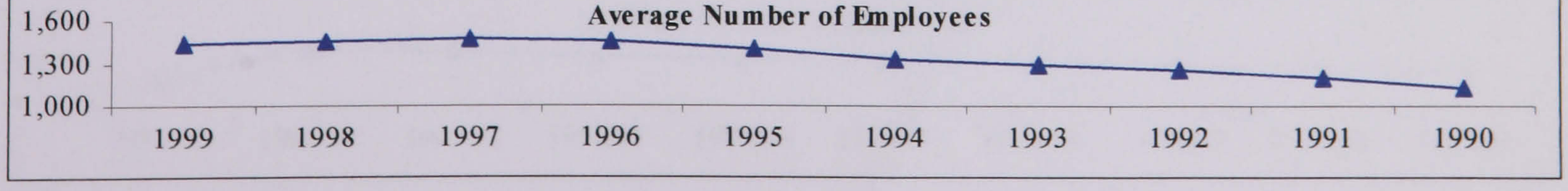




## CGN – Cologne, Germany

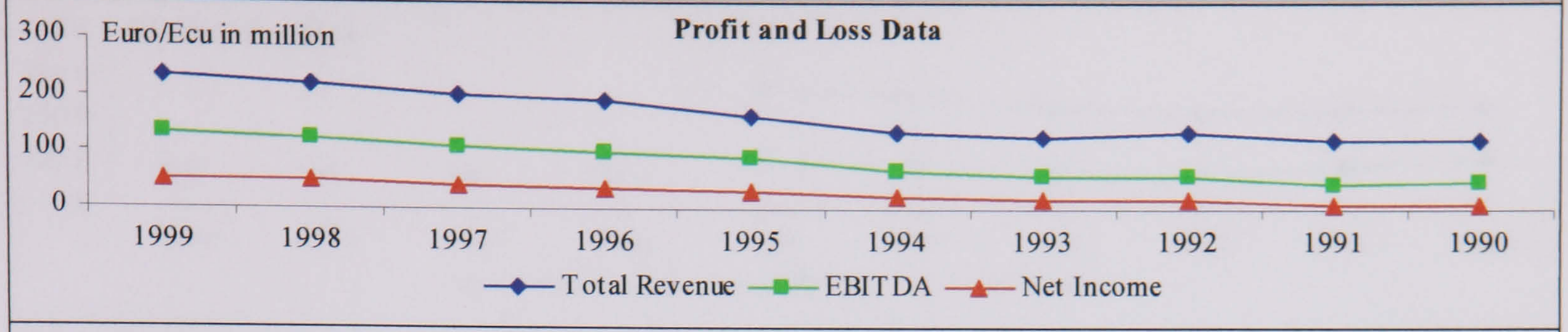


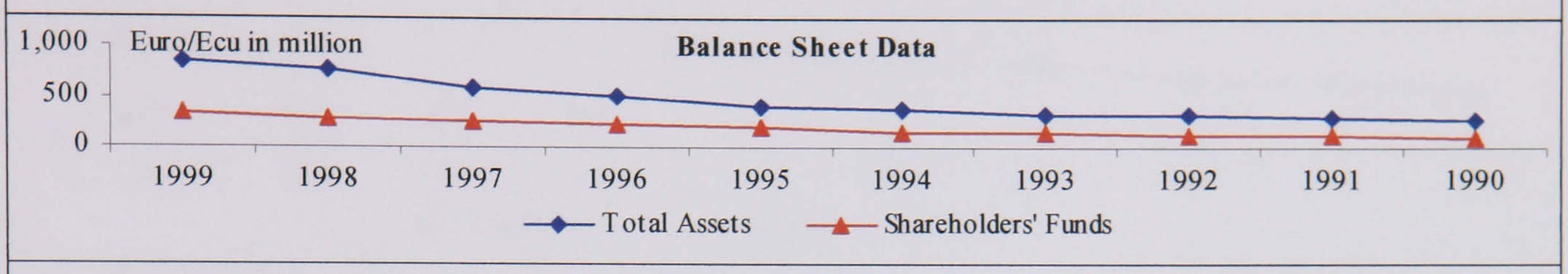



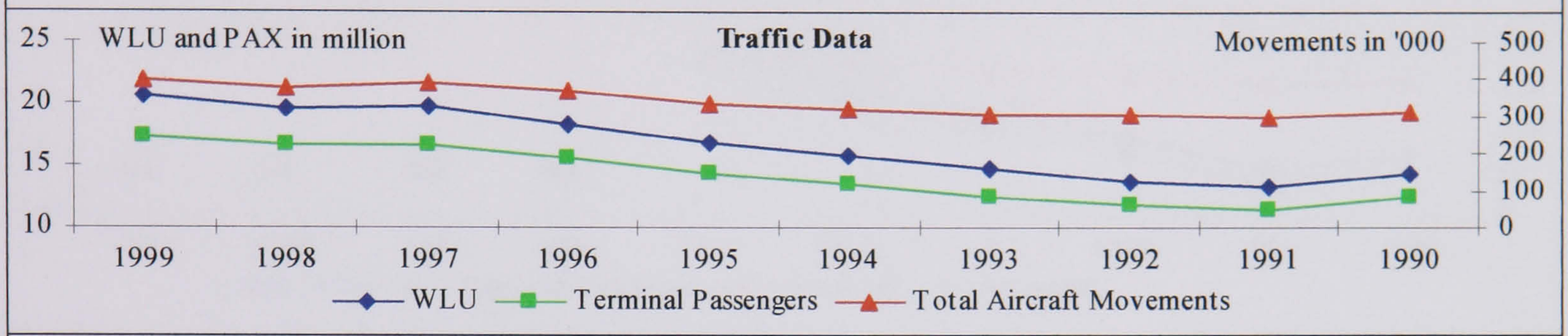



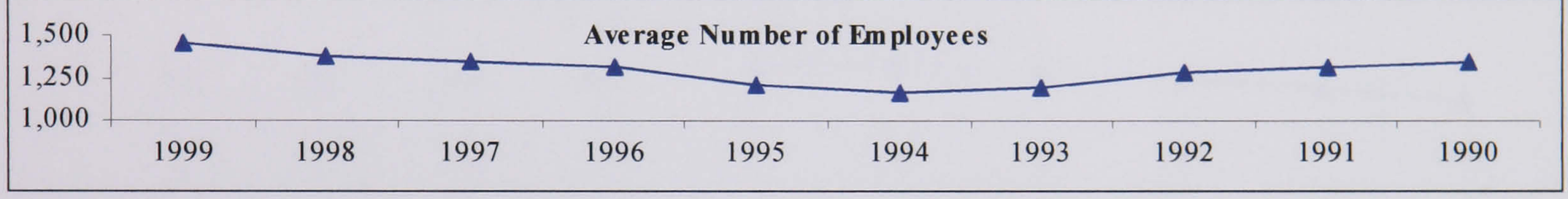



## CPH – Copenhagen, Denmark

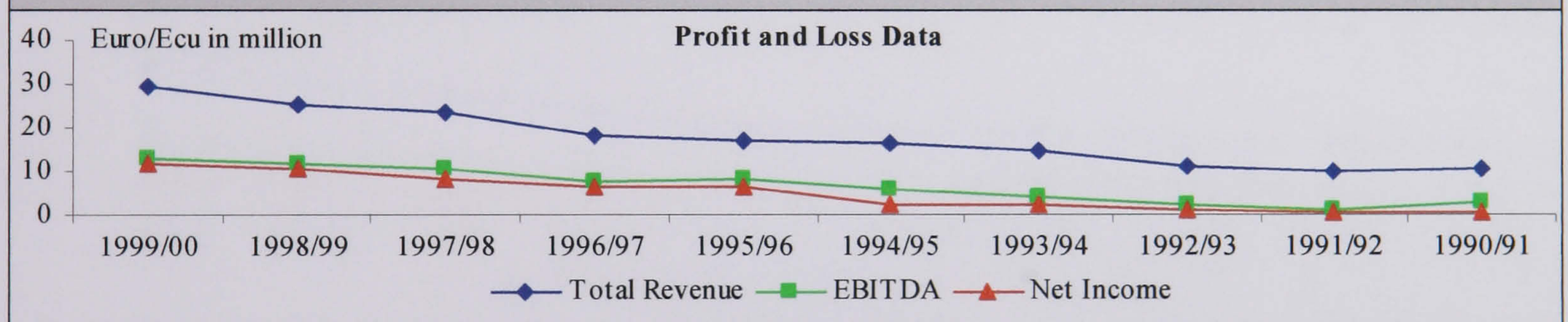


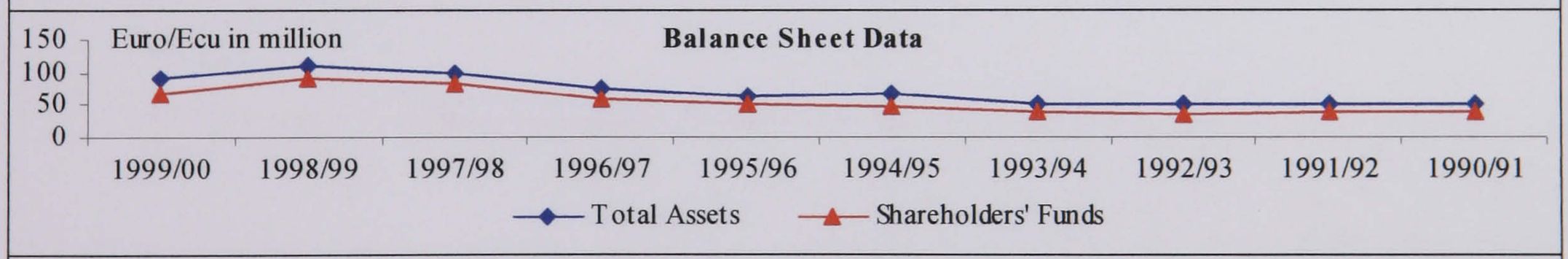



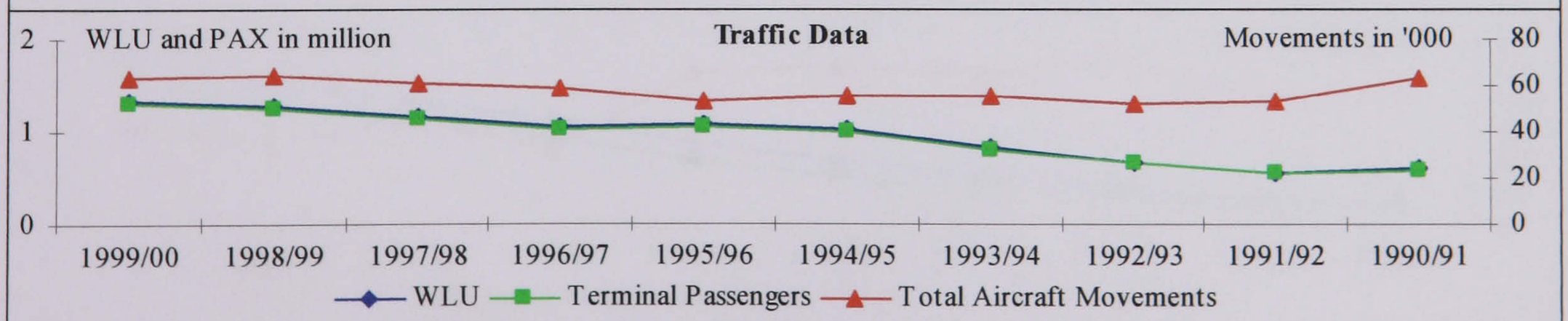



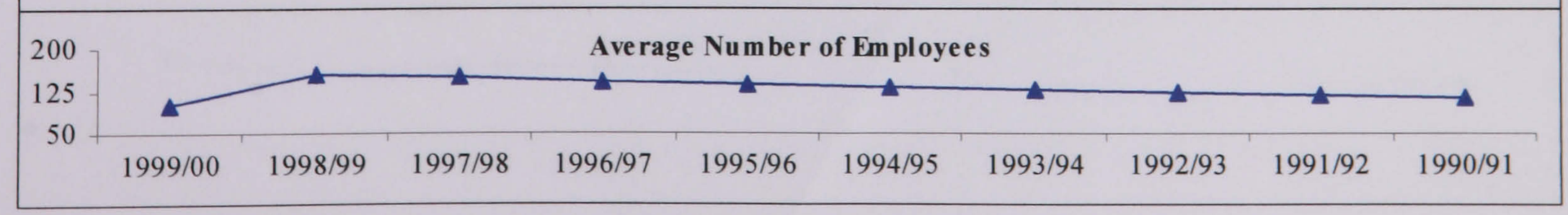




## CWL – Cardiff, UK

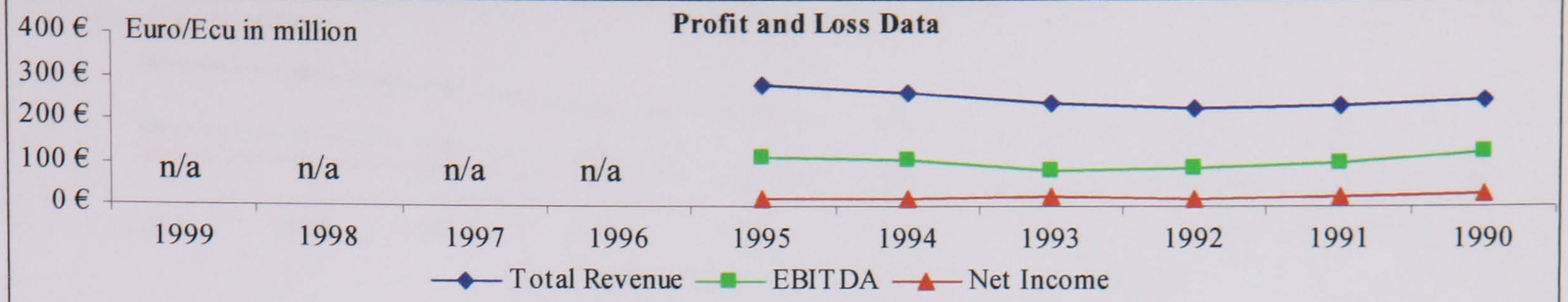


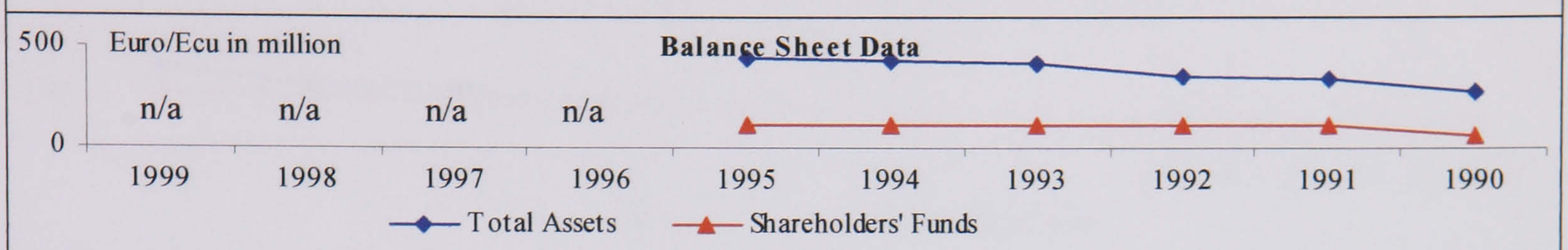



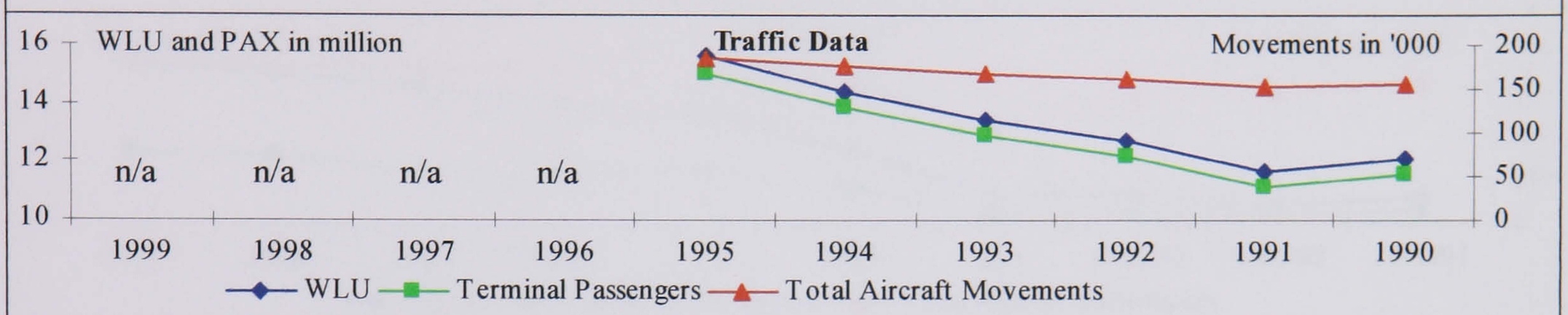



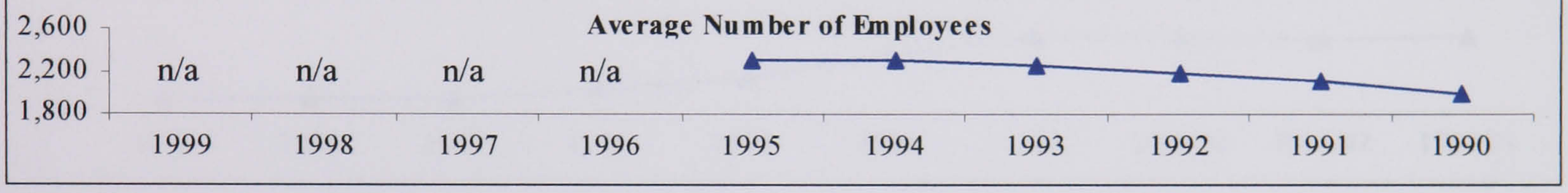



## DUS – Dusseldorf, Germany

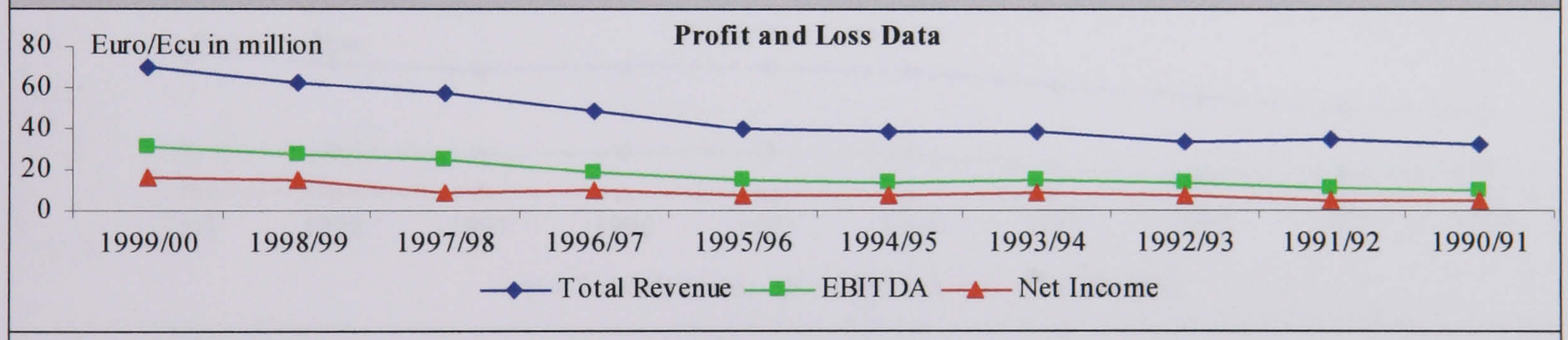


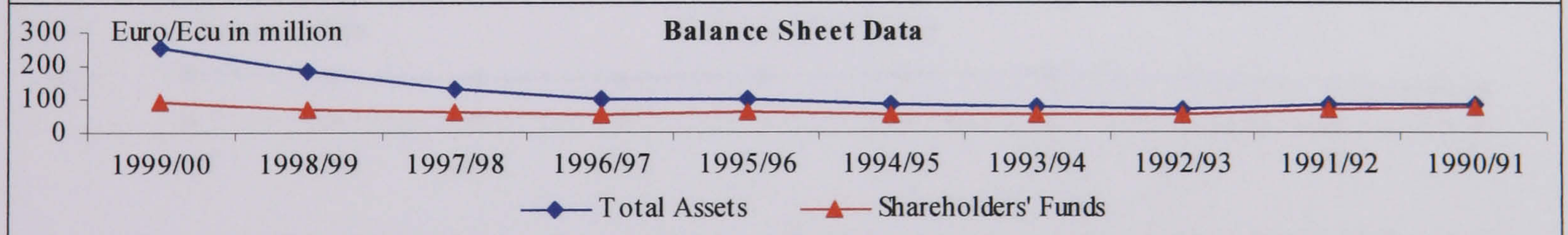



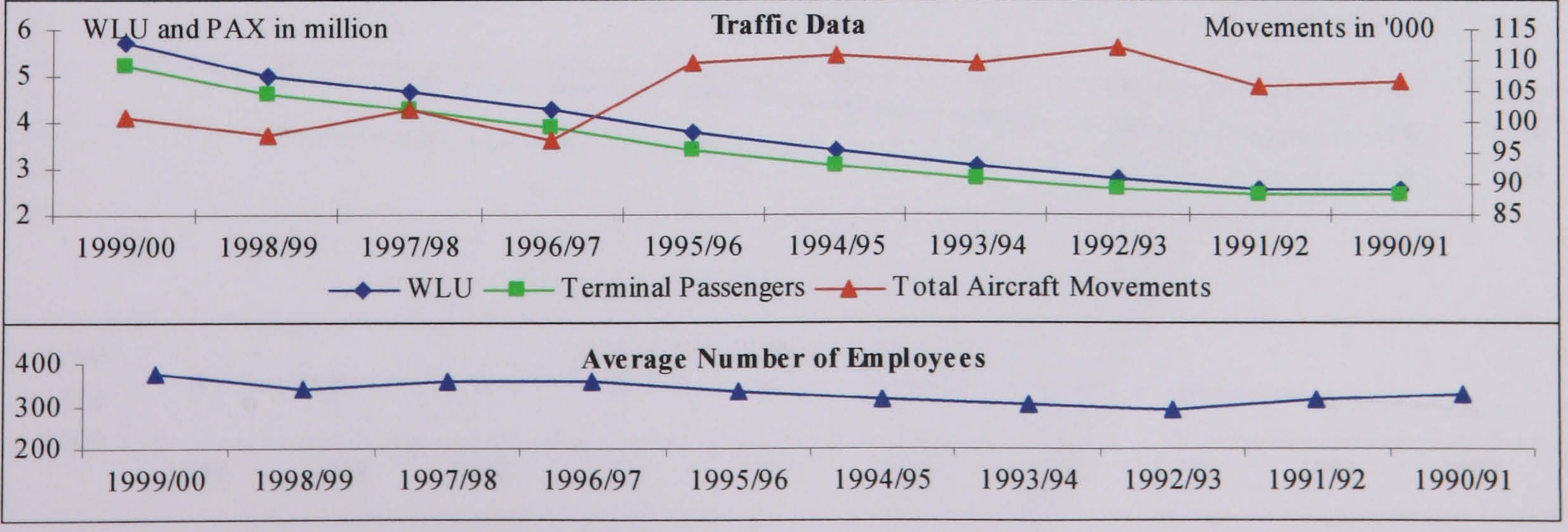



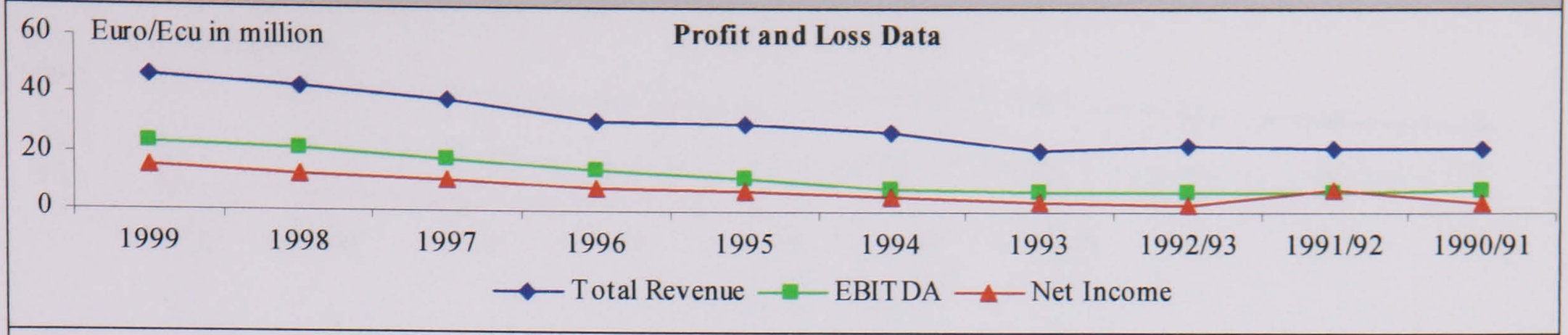

## EDI – Edinburgh, UK

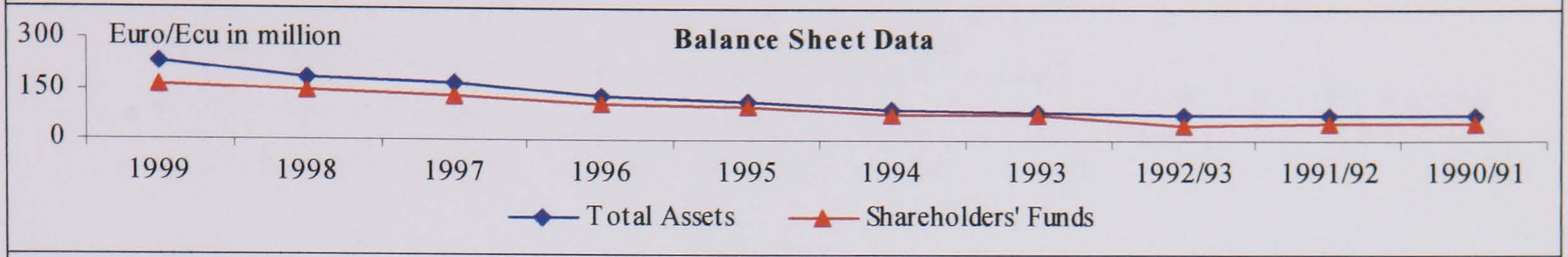


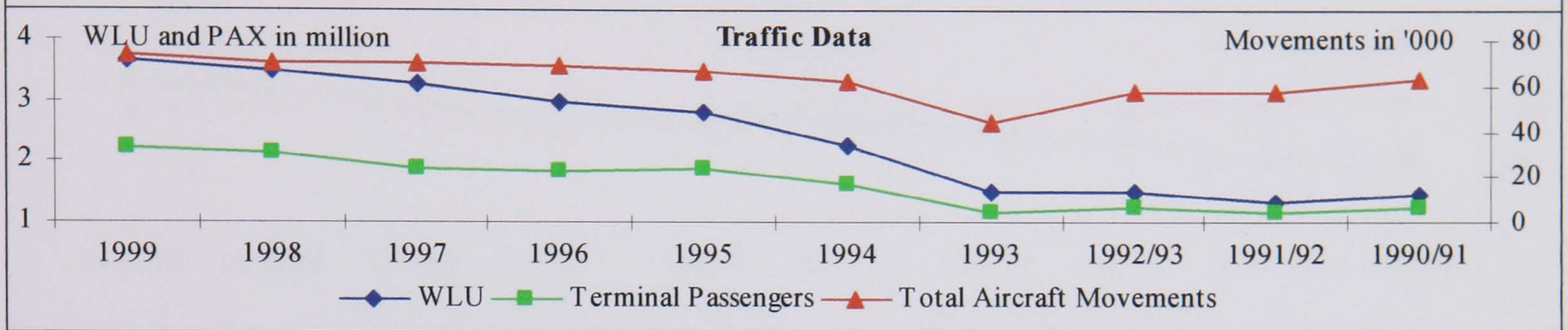



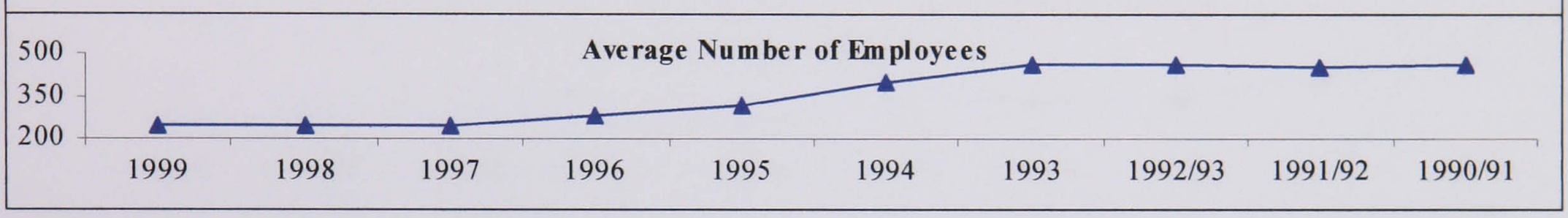



## EMA – East Midlands, UK

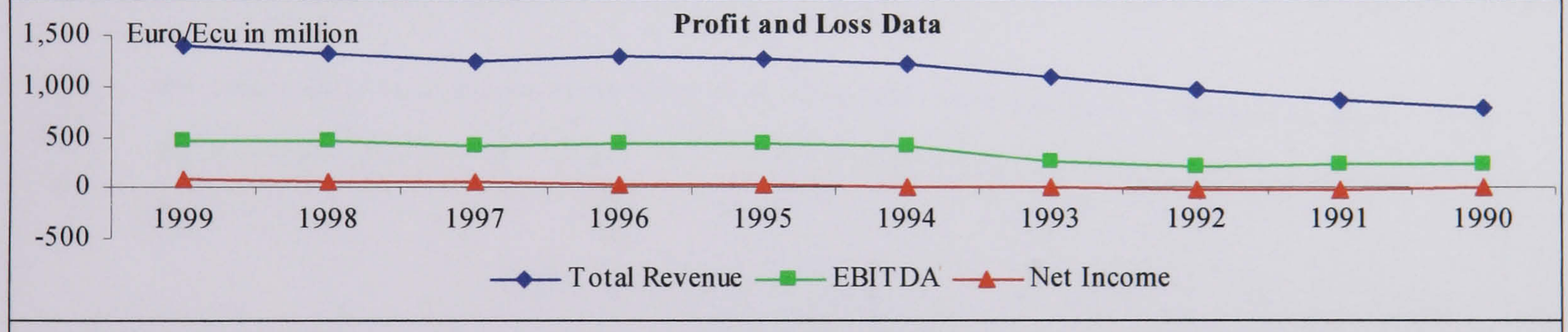


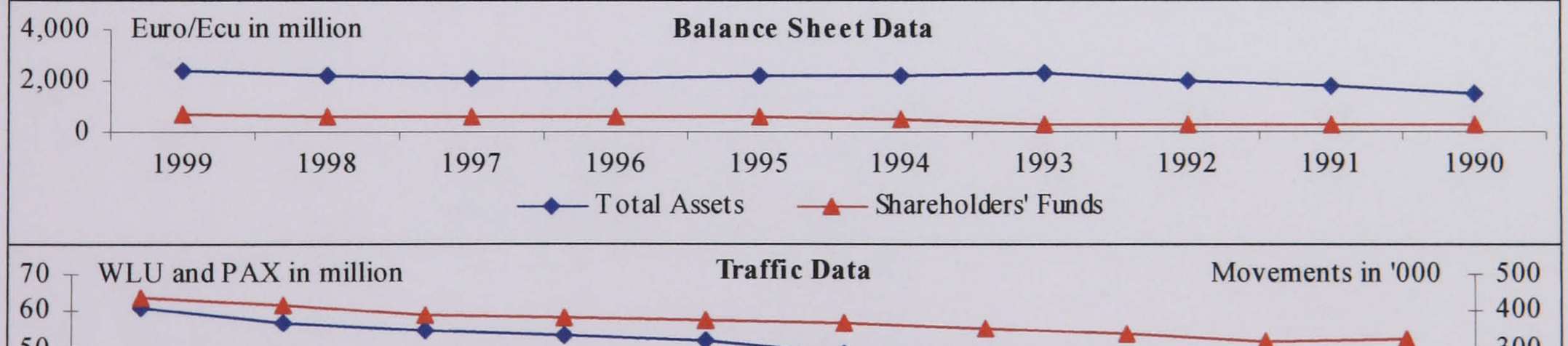



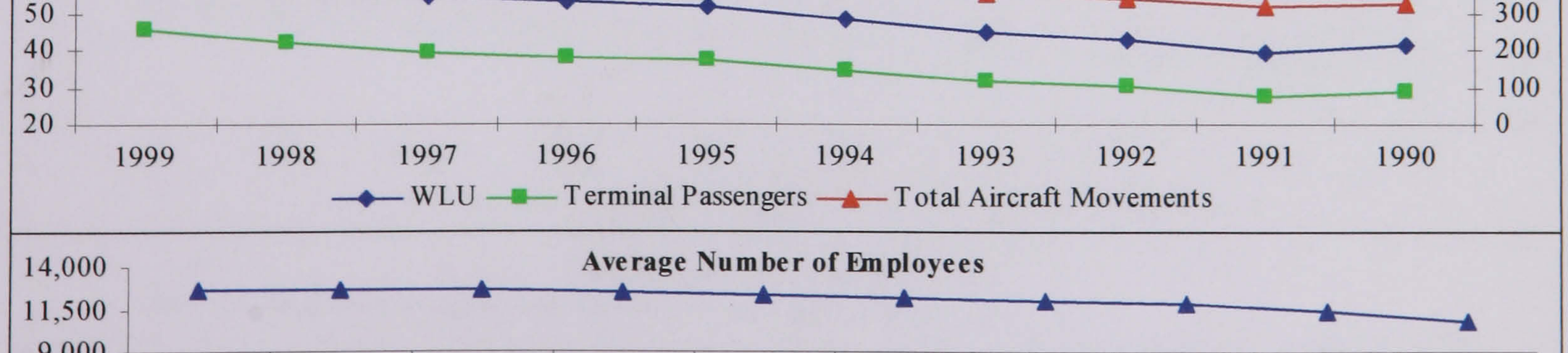



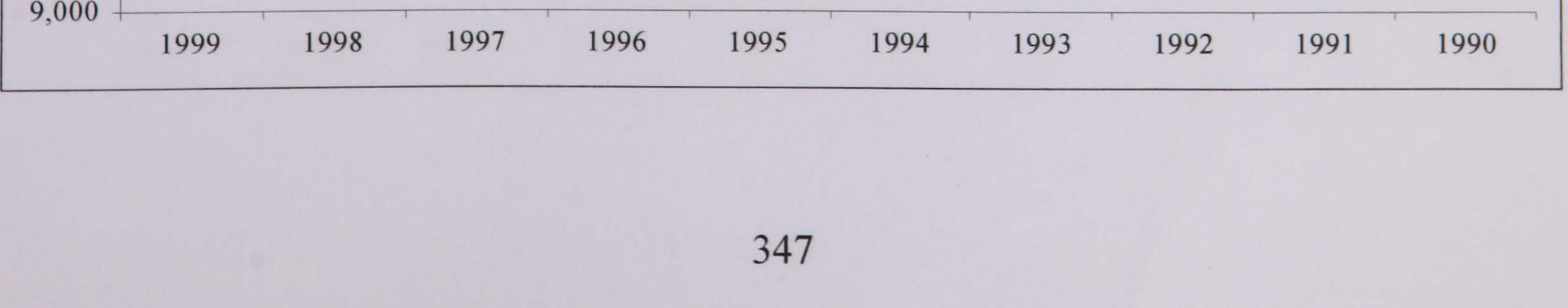




## FRA – Frankfurt, Germany

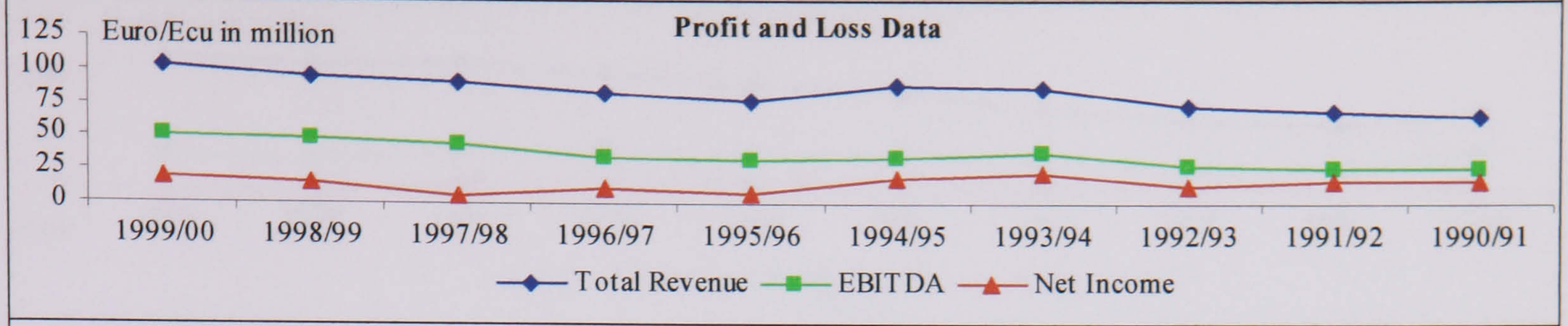


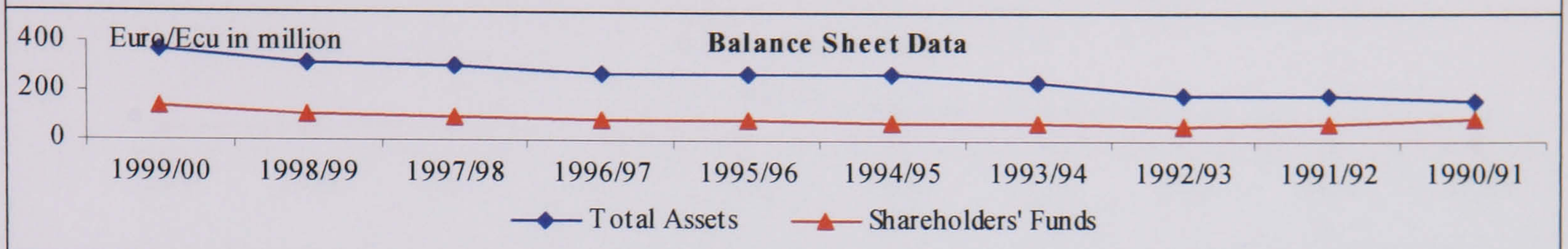



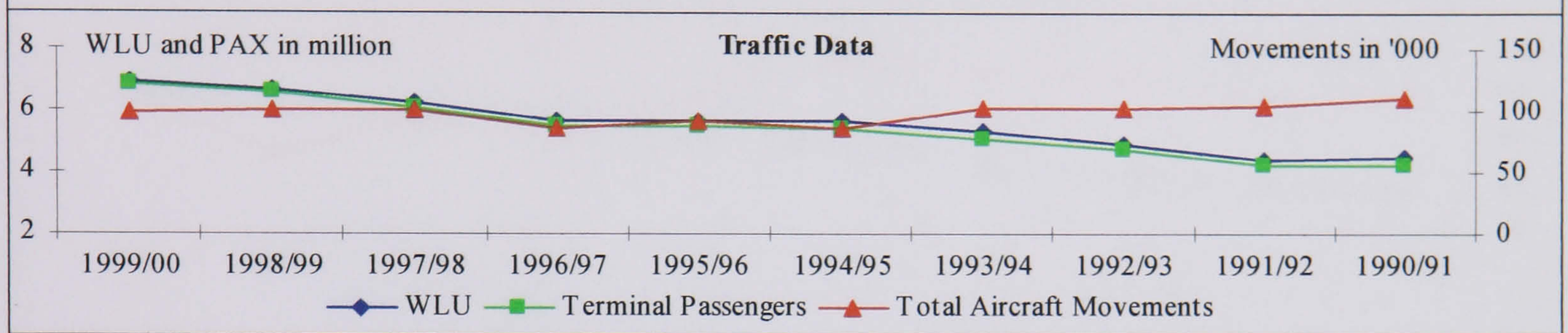



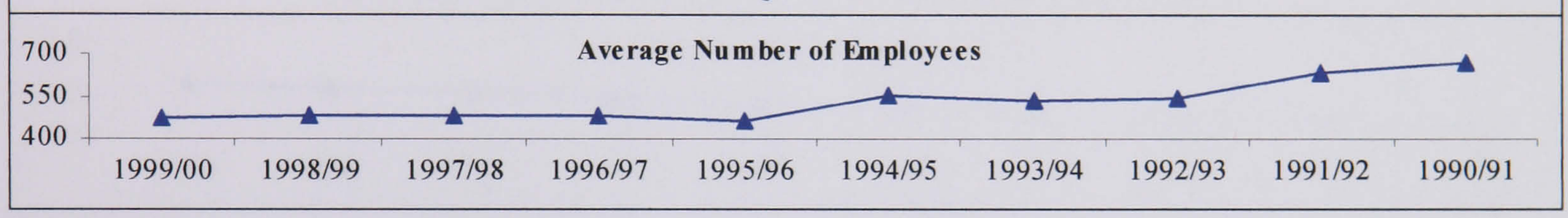



## GLA – Glasgow, UK

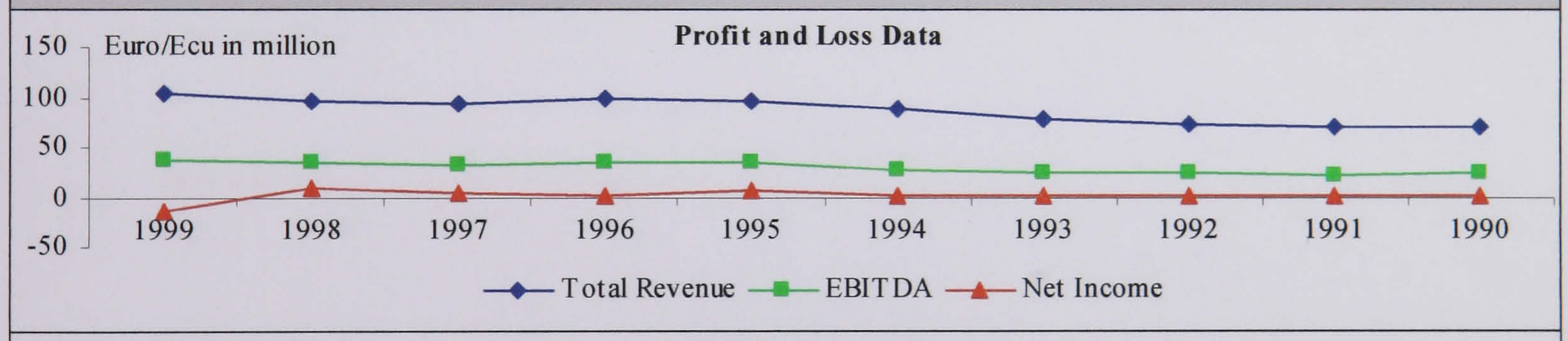


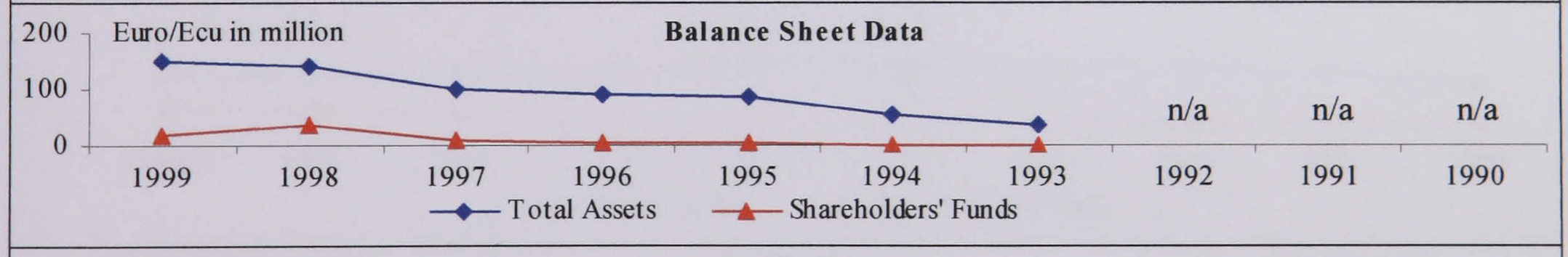



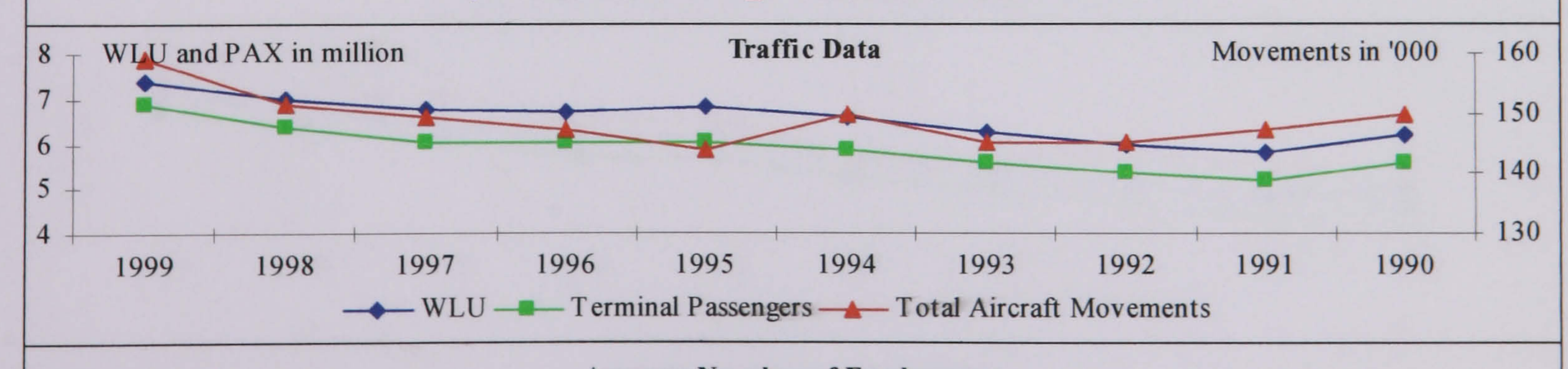



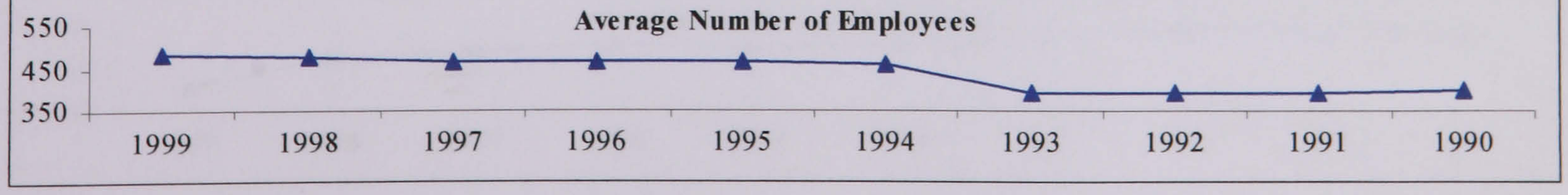




## GVA – Geneva, Switzerland

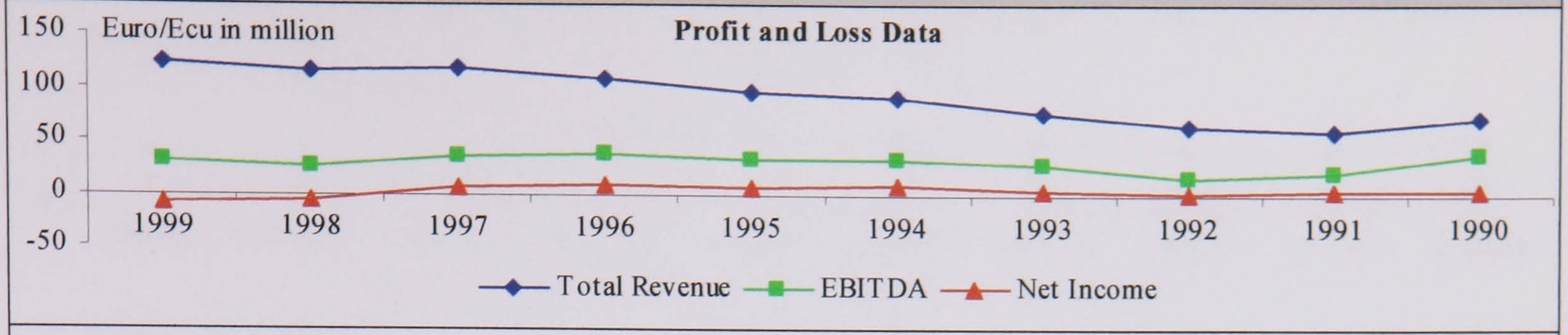


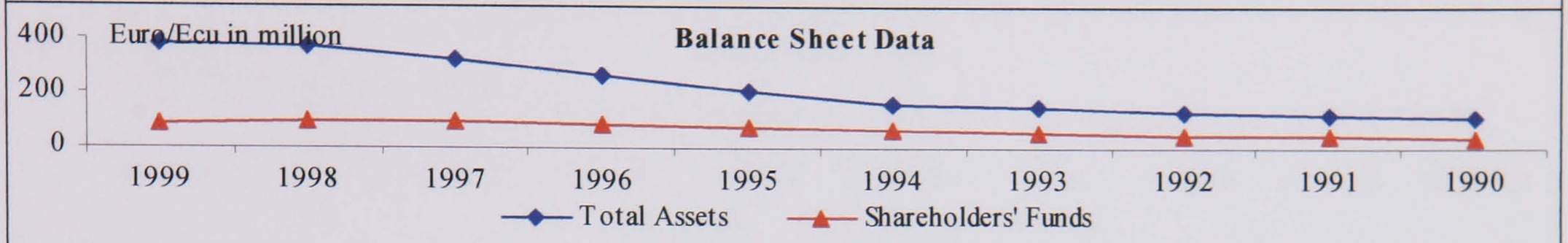



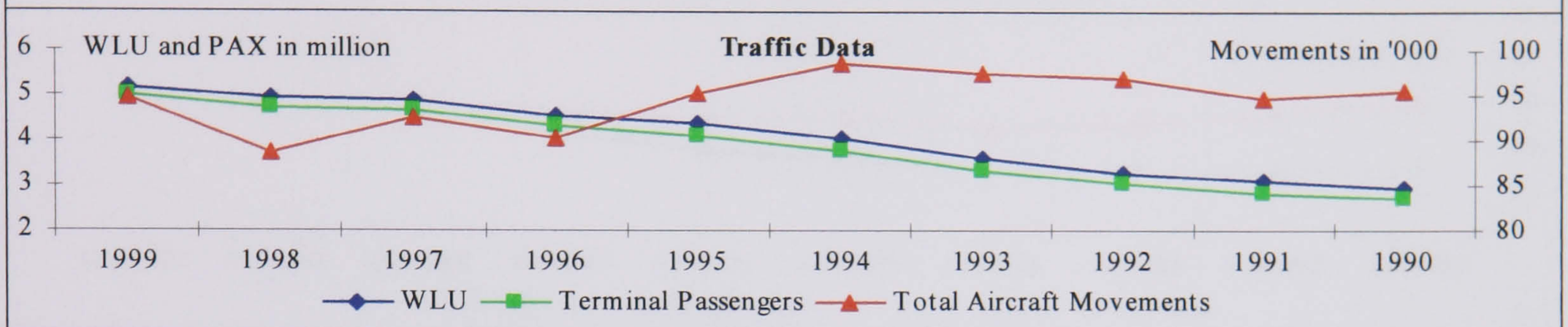



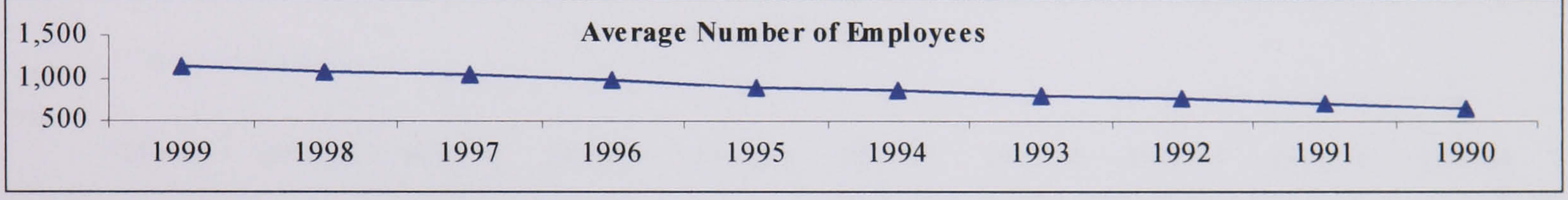



## HAJ – Hanover, Germany

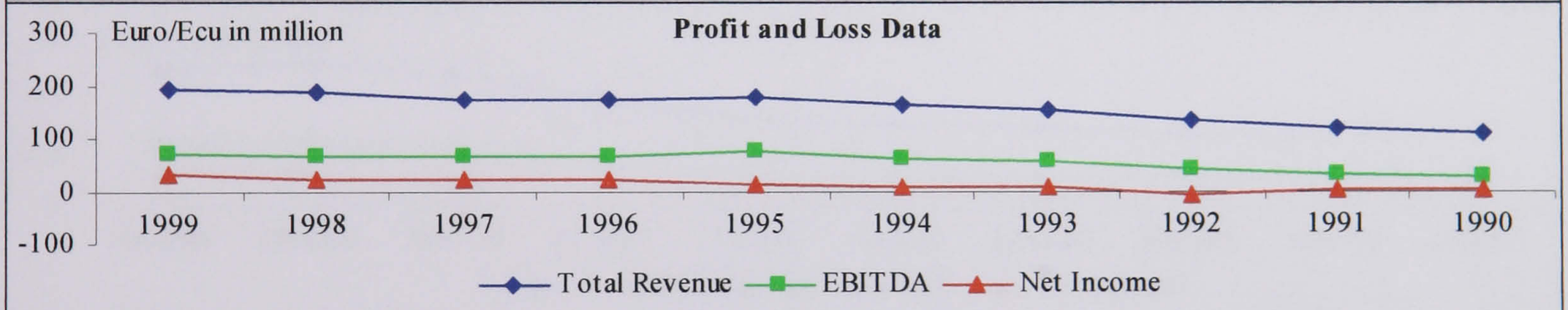


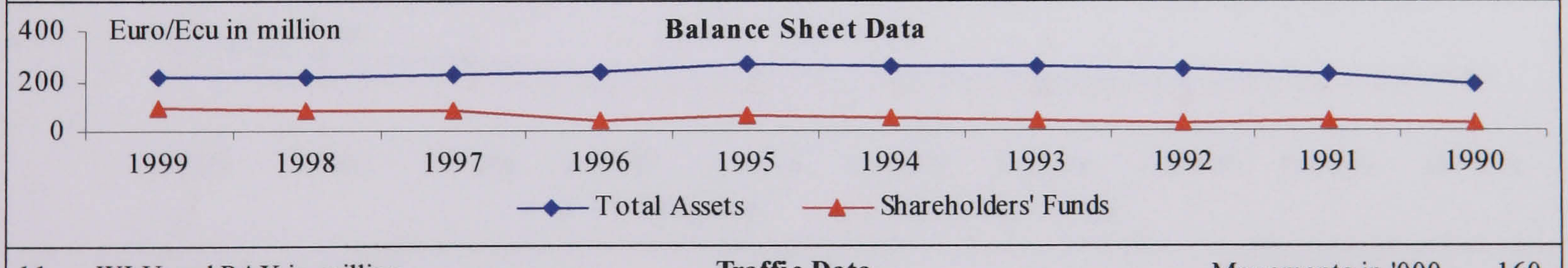



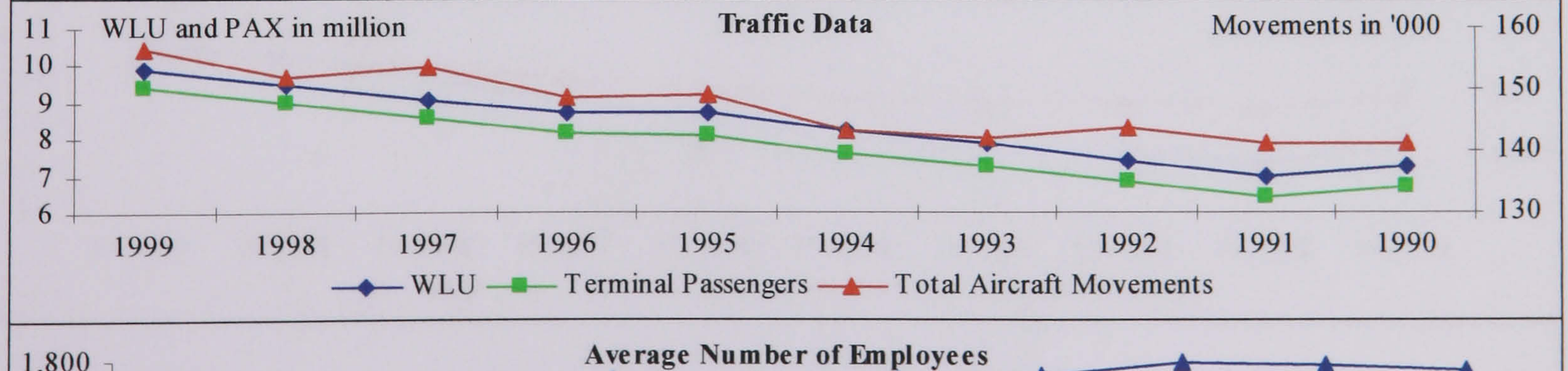



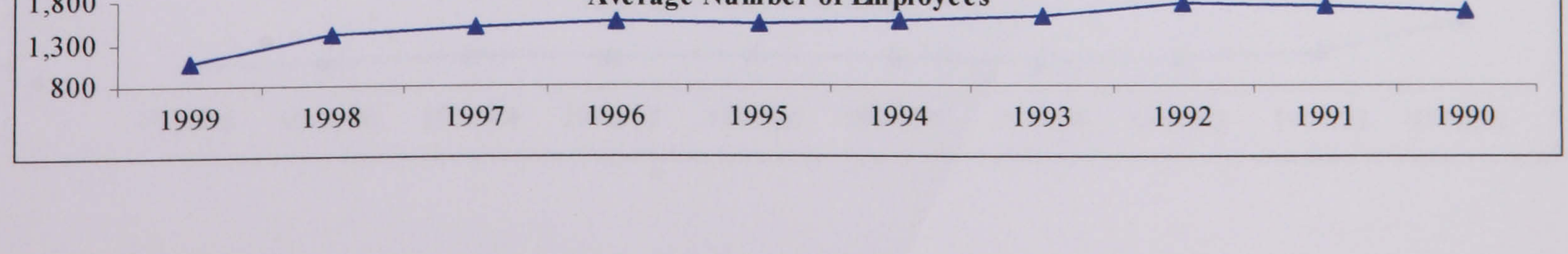




## HAM – Hamburg, Germany

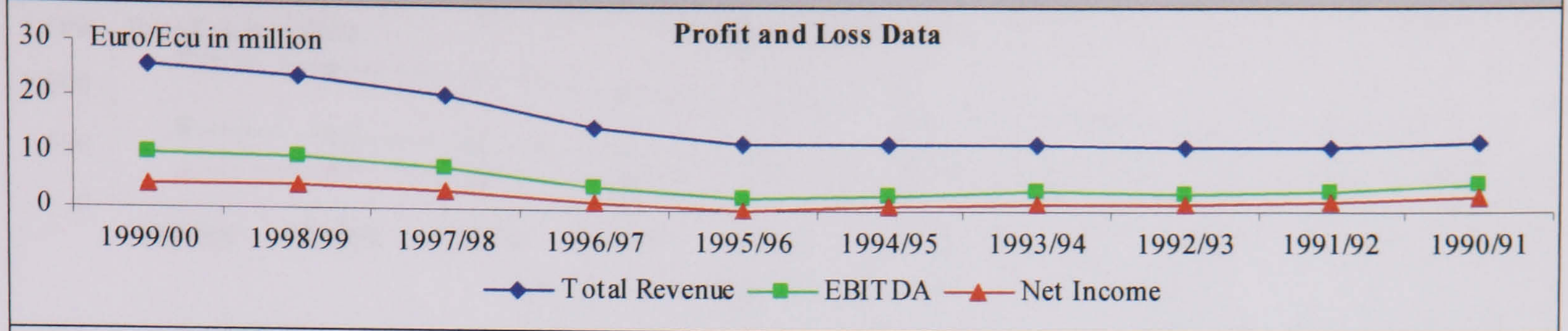


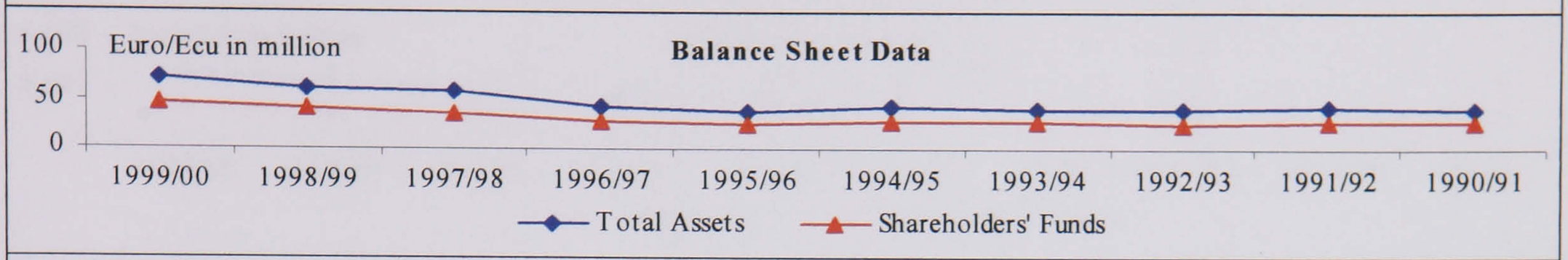



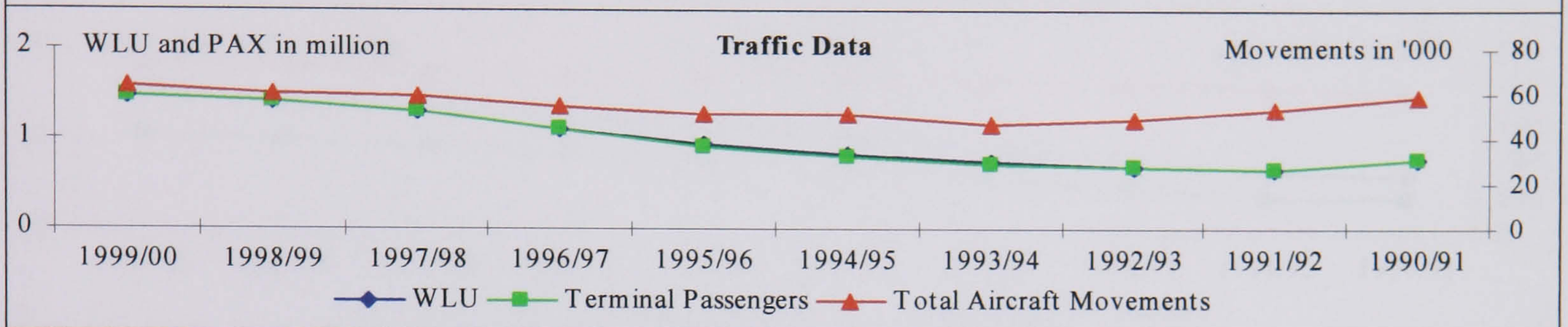



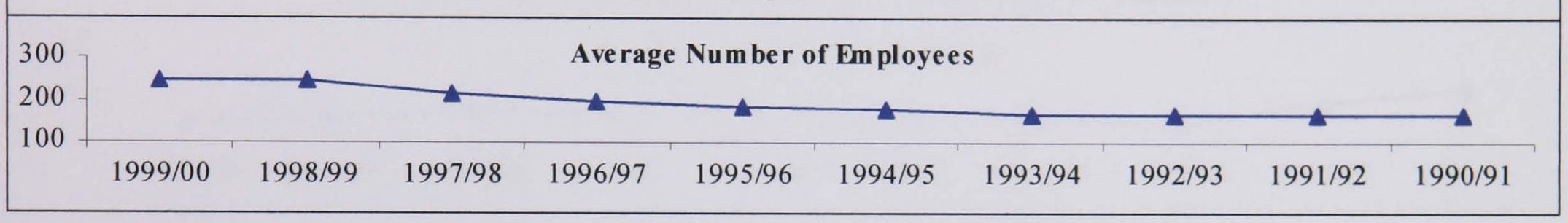



## LBA – Leeds Bradford, UK

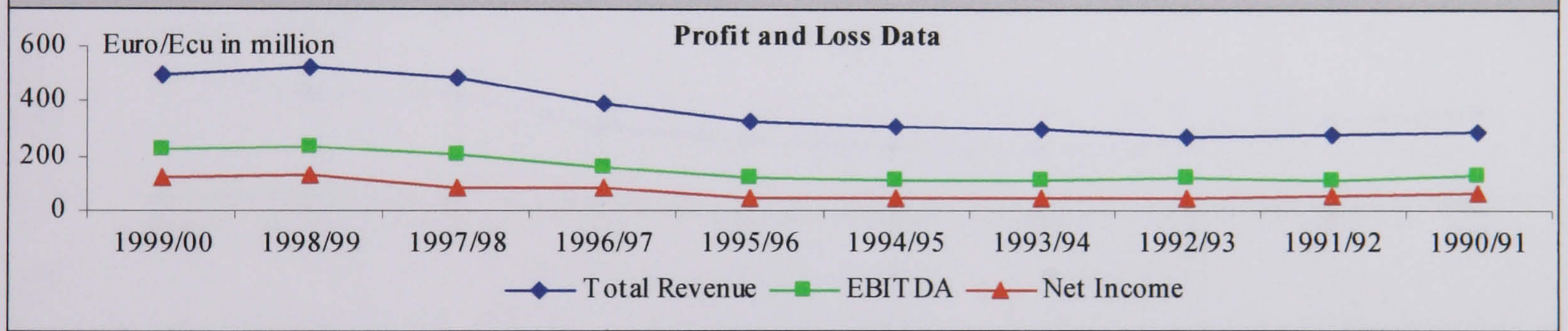


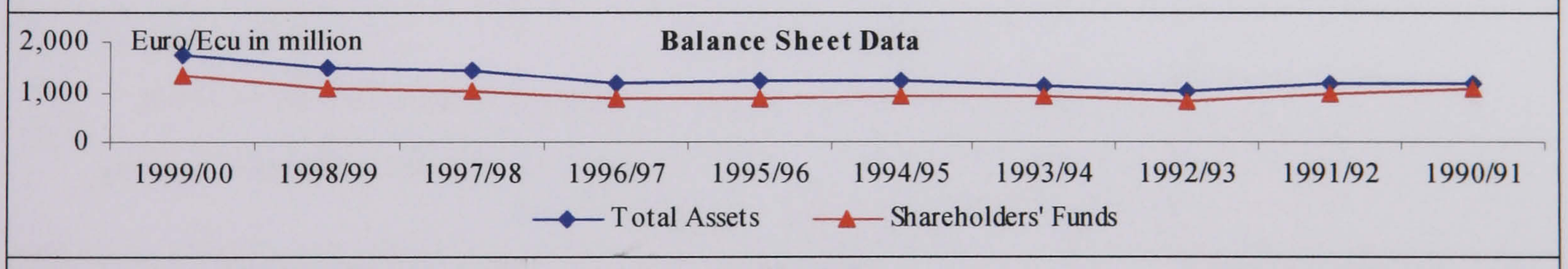



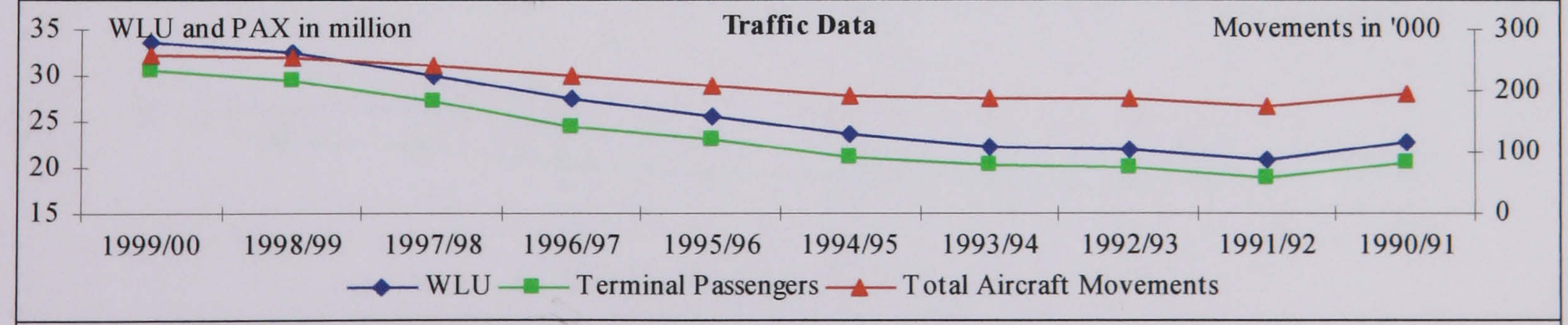



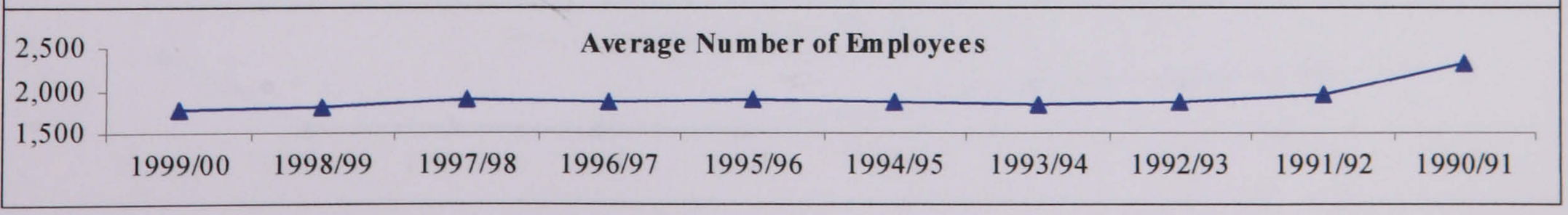




## LGW – London Gatwick, UK

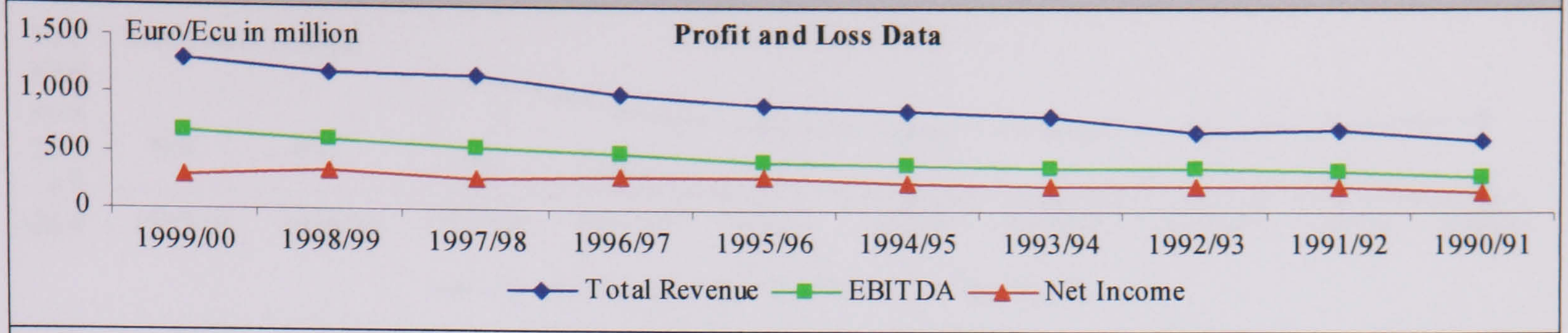


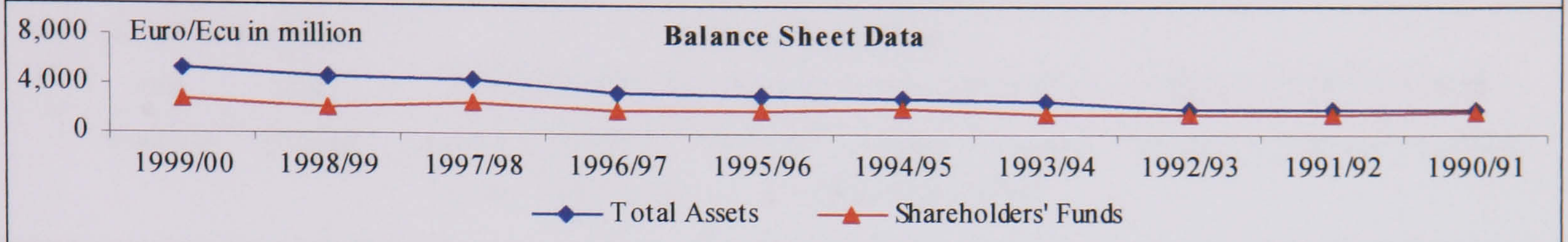



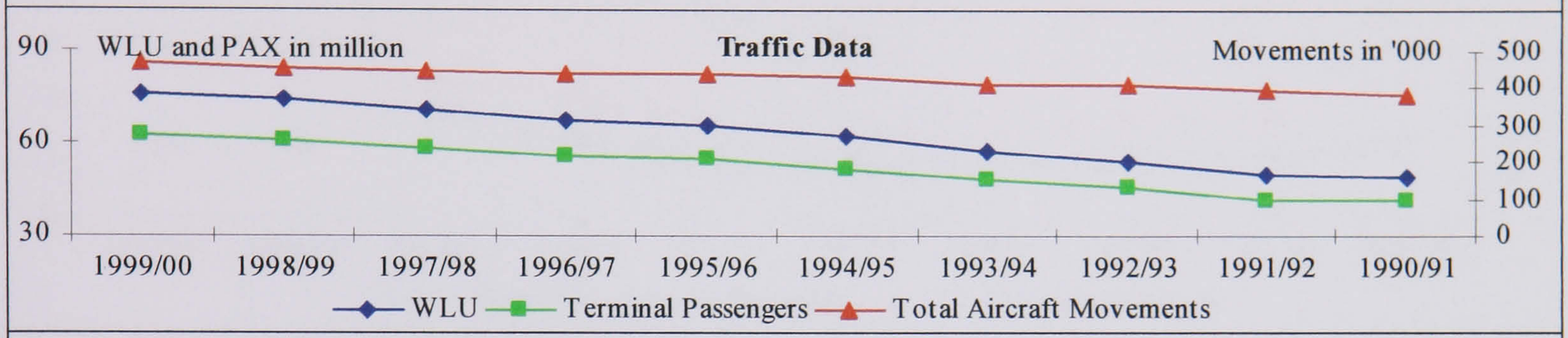



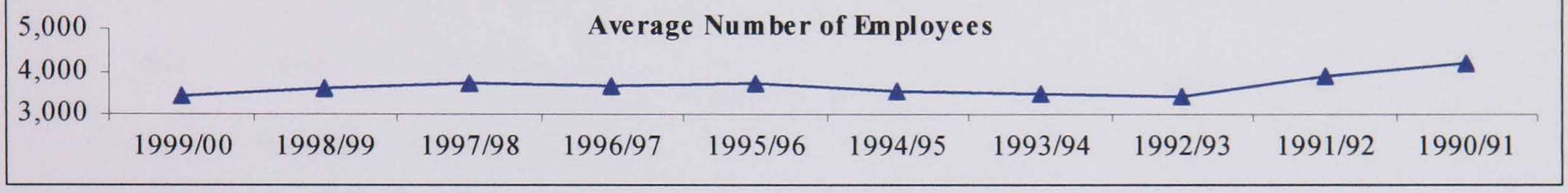



## LHR – London Heathrow, UK

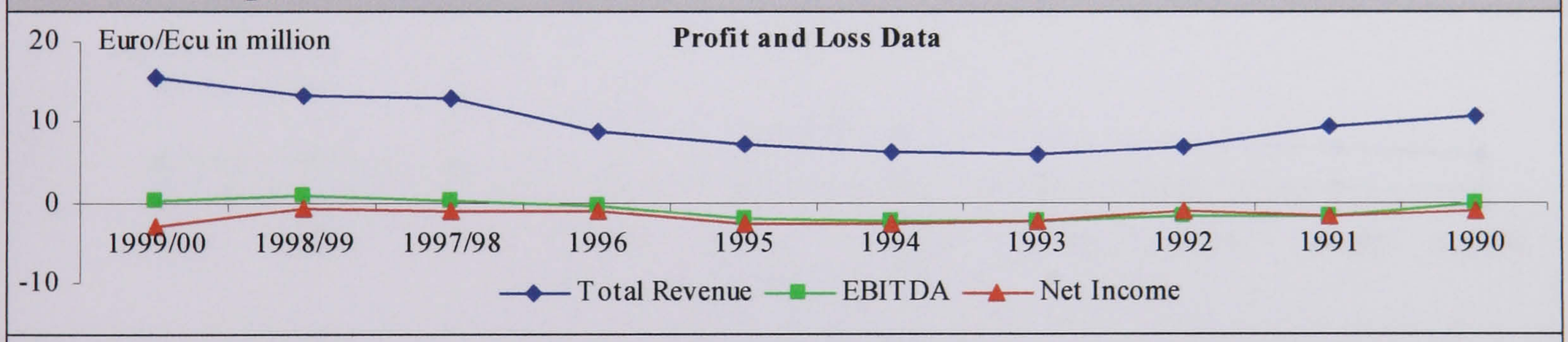


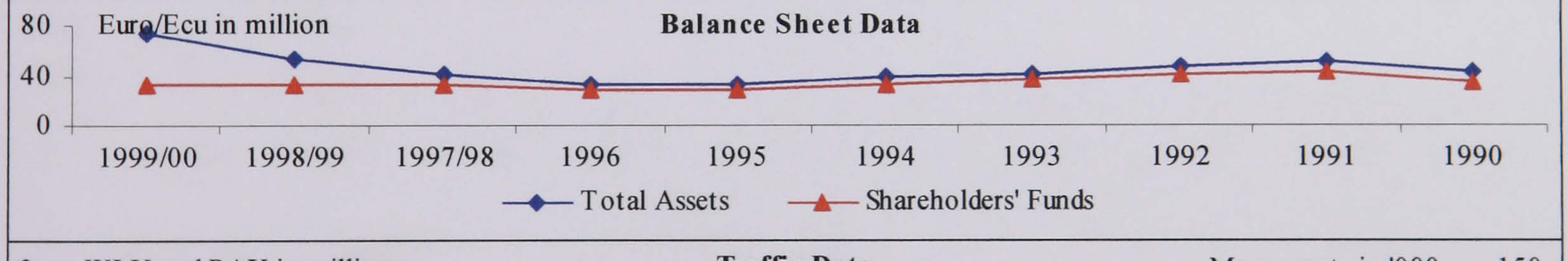



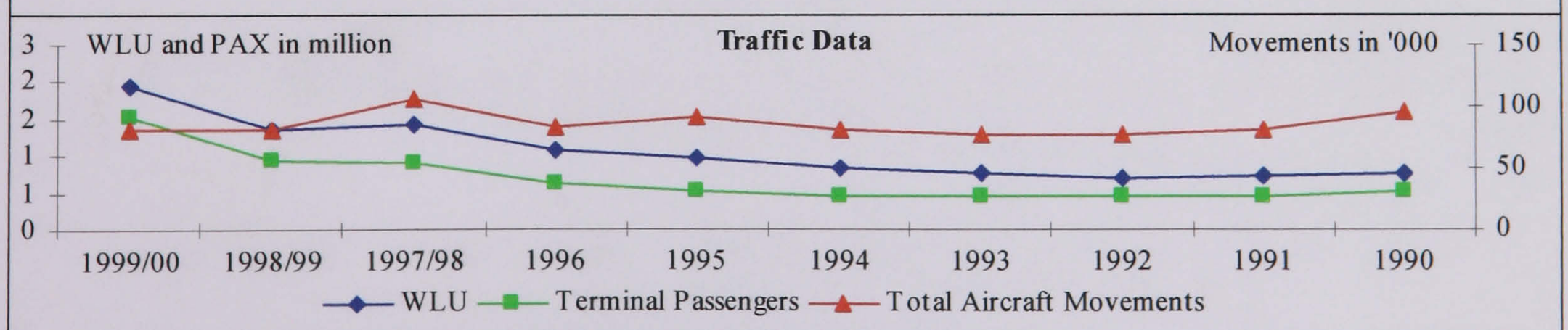



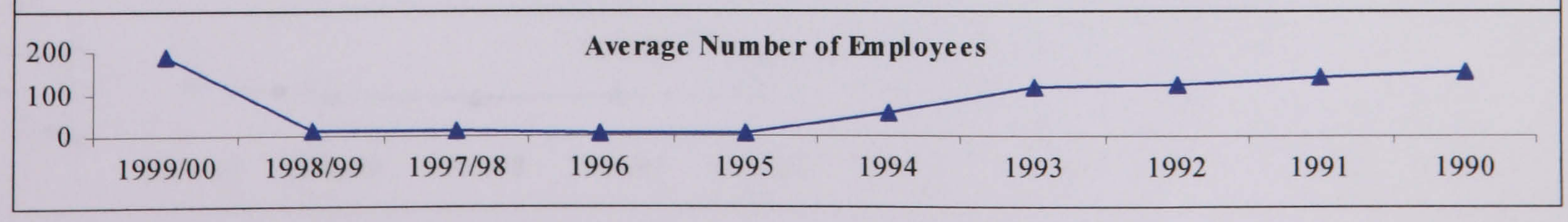




## LPL – Liverpool, UK

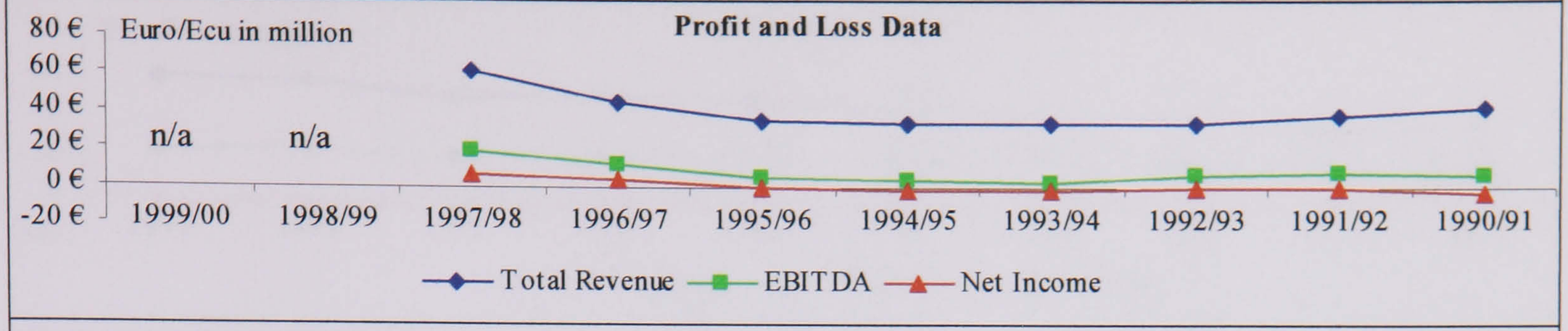


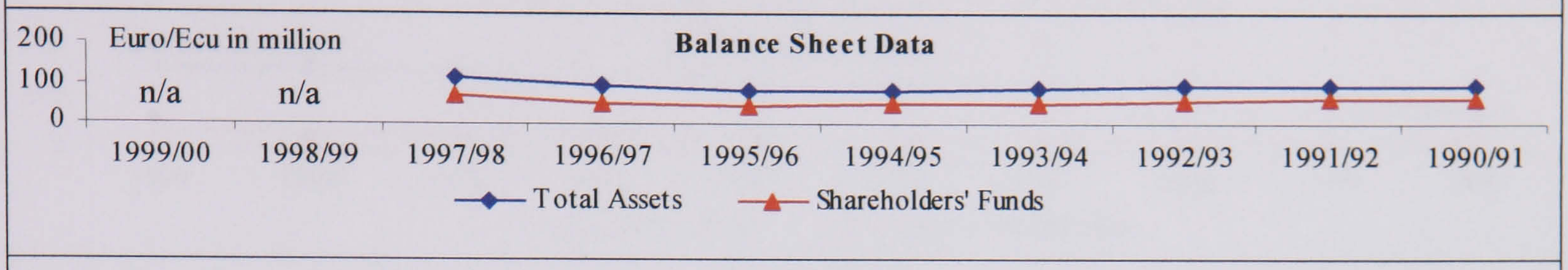



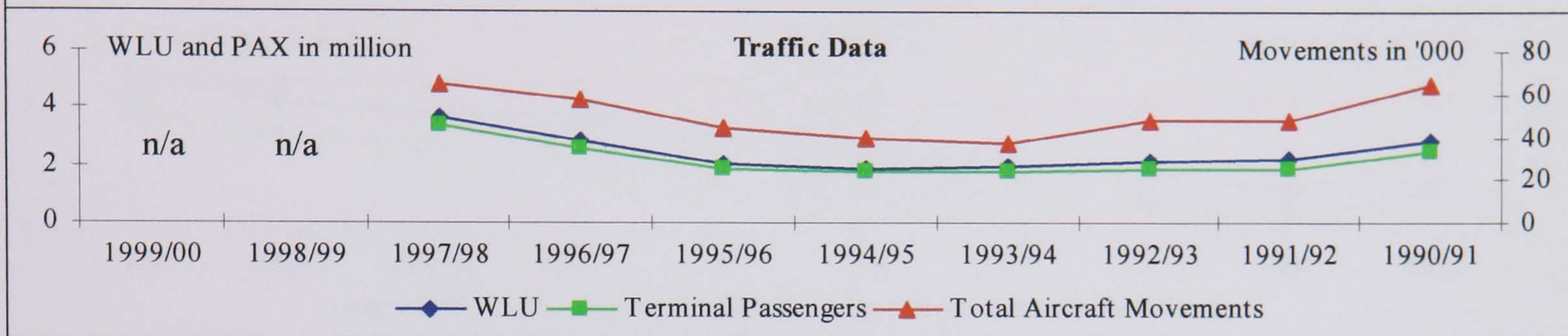



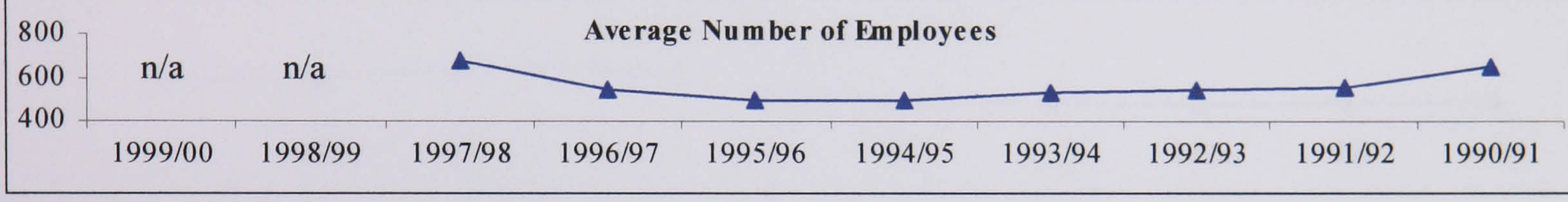



## LTN – Luton, UK

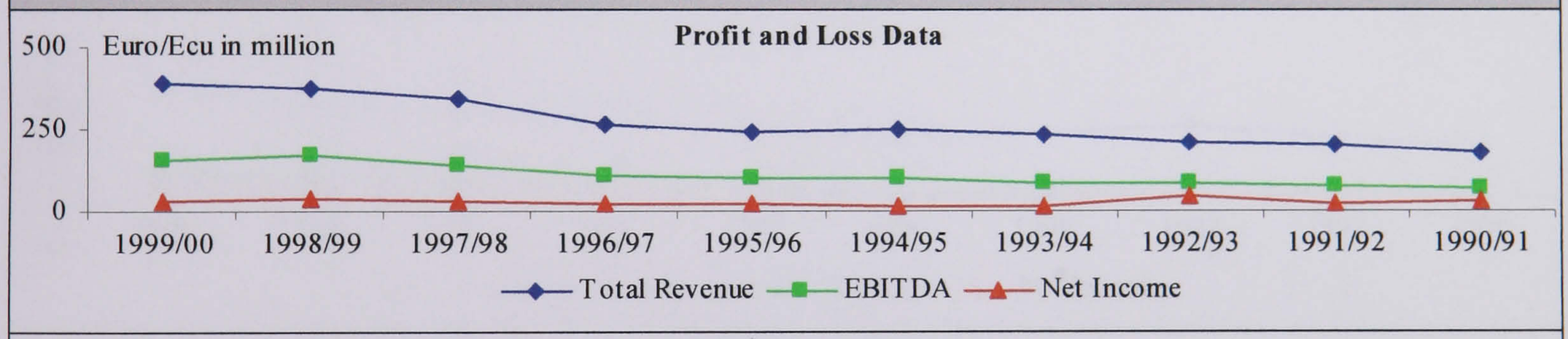


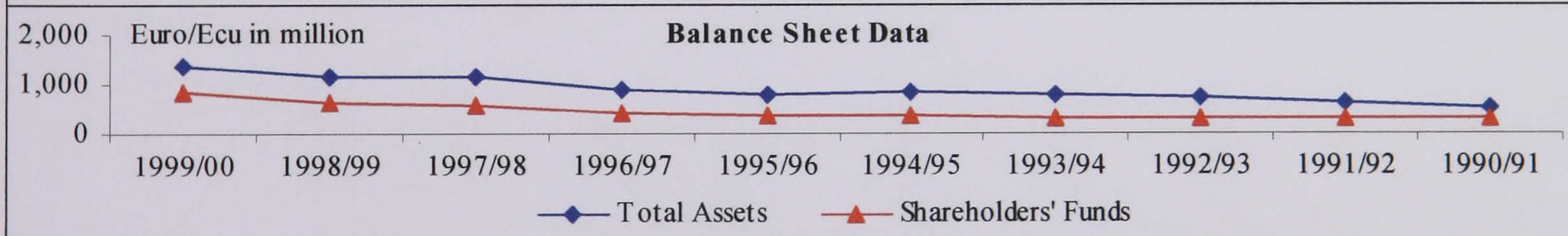



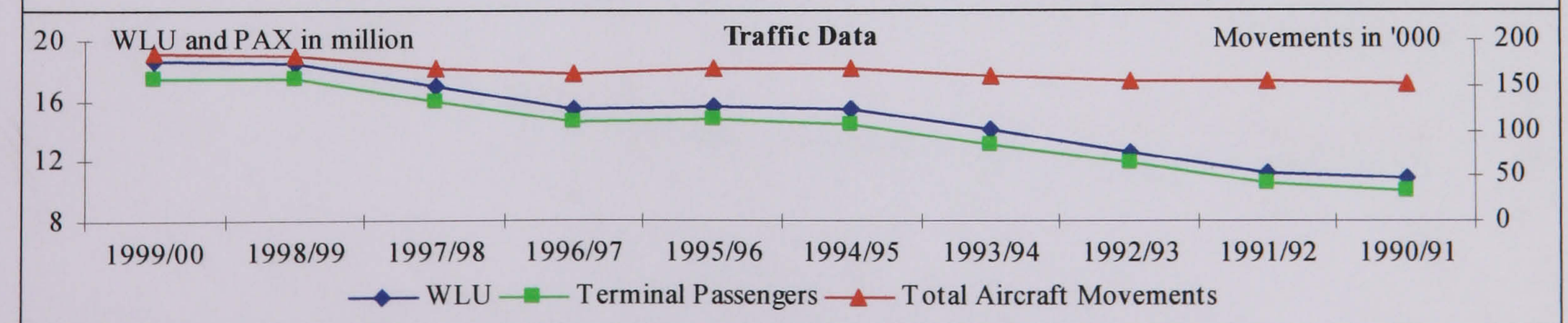



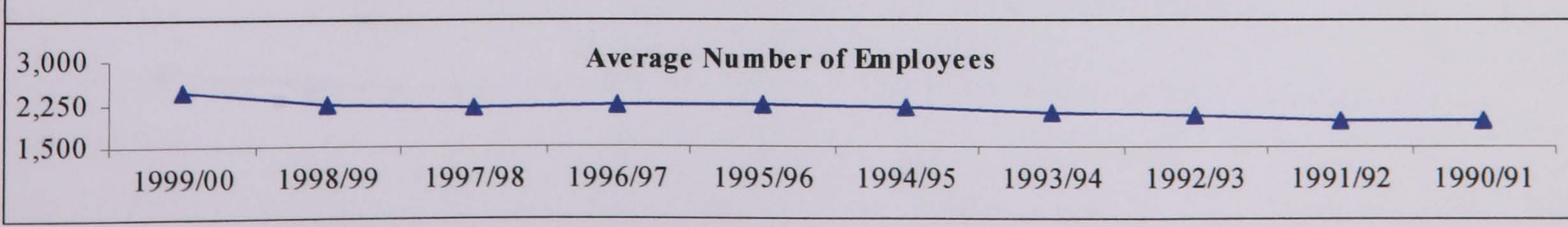




## MAN – Manchester, UK

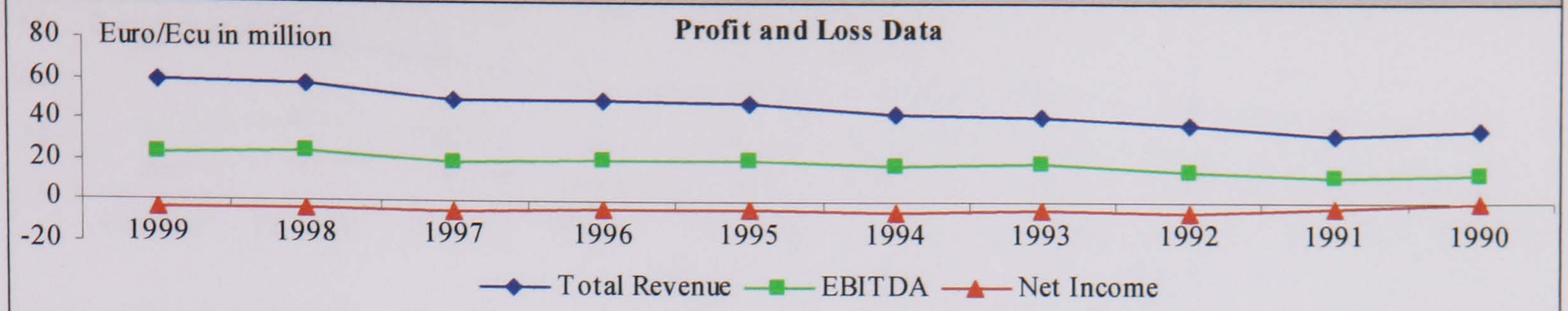


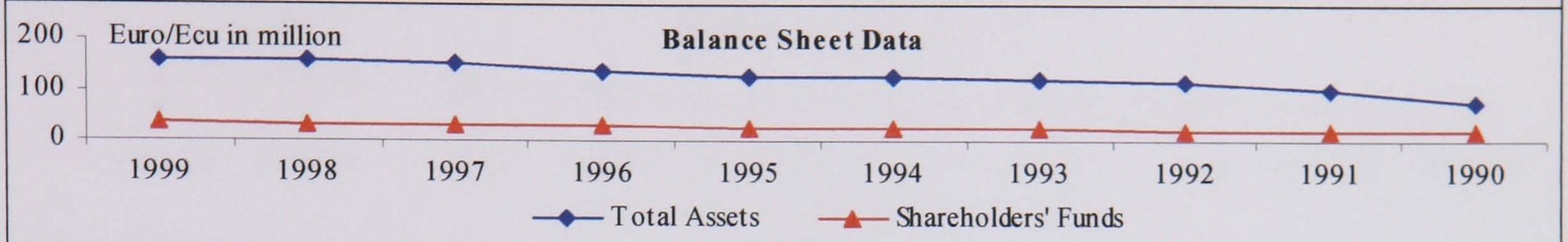



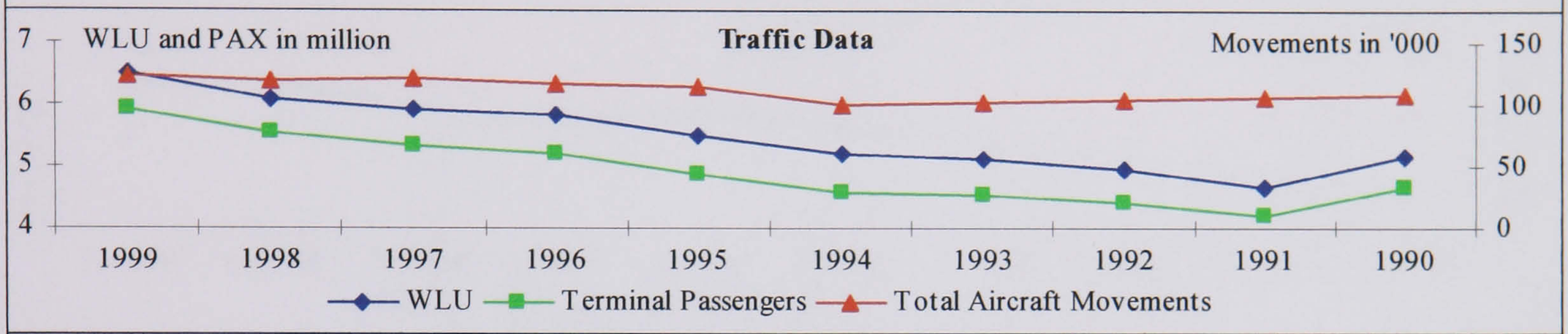



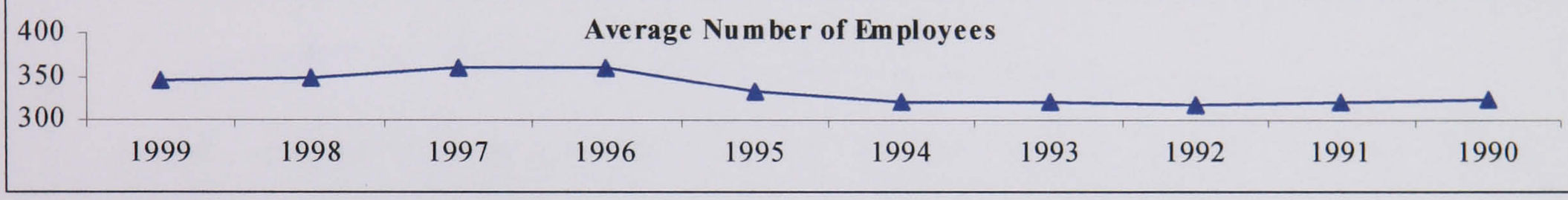



## MRS – Marseille, France

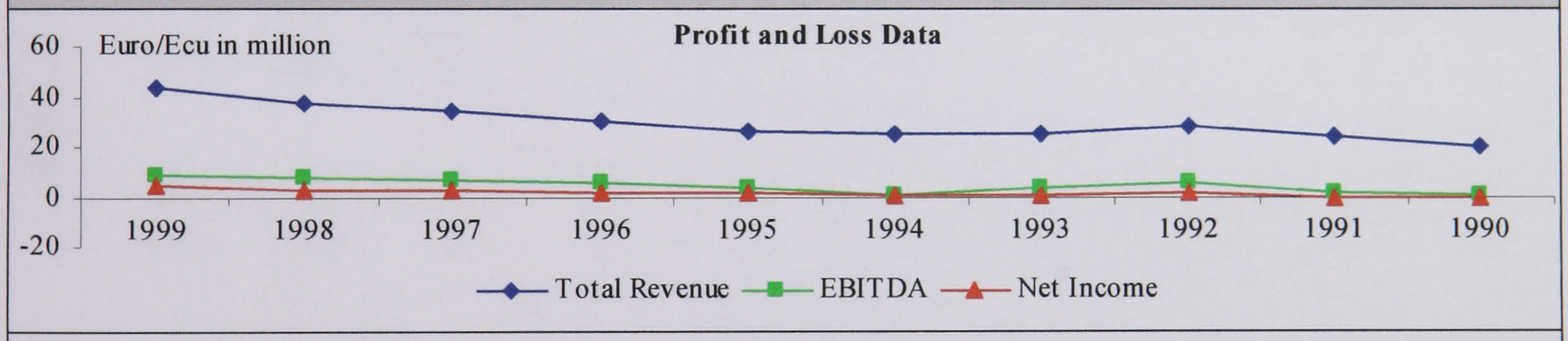


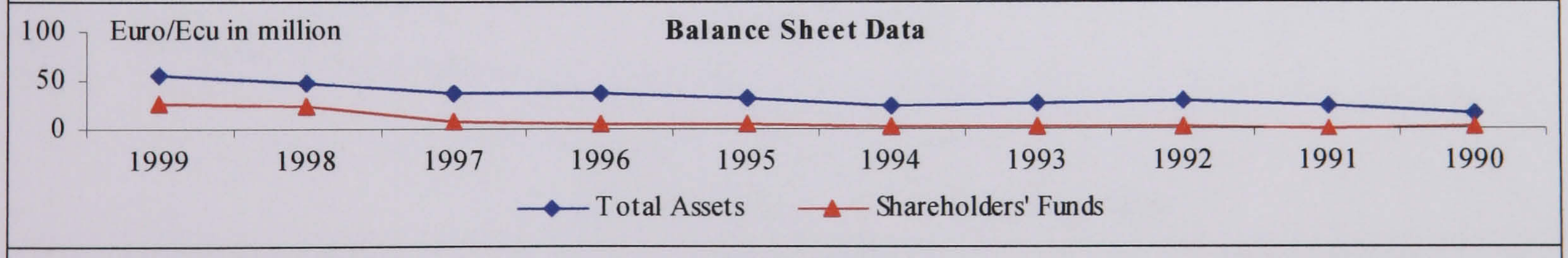



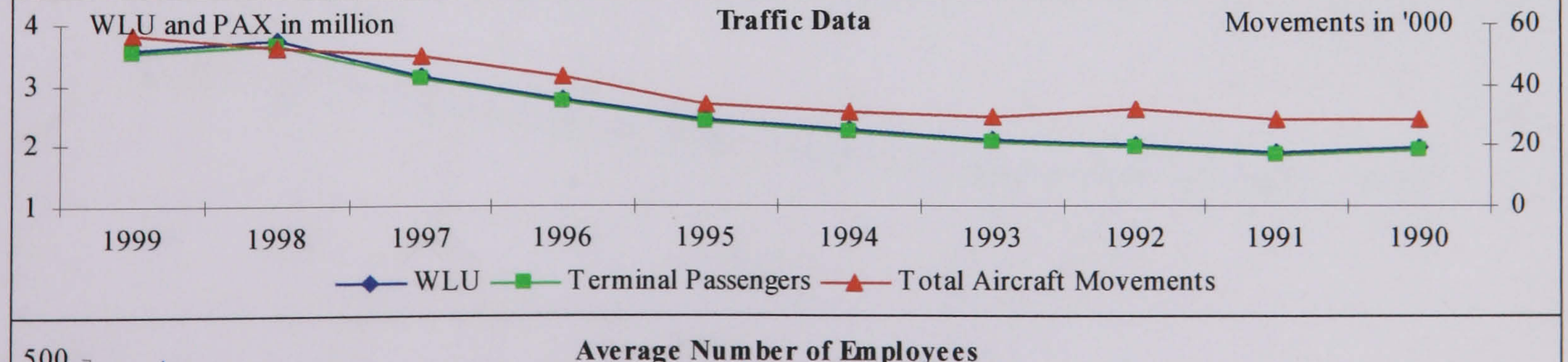



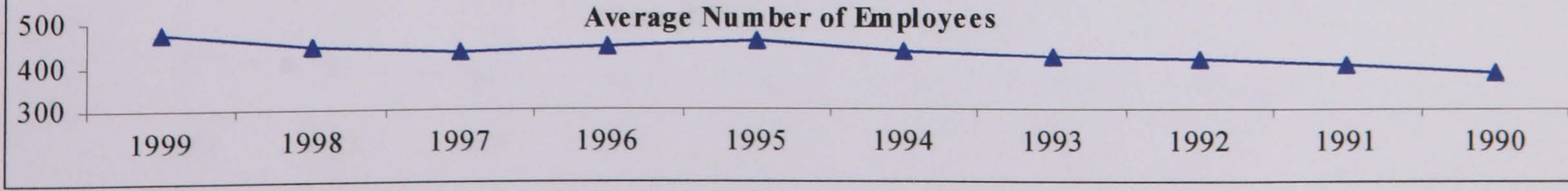




## NAP – Naples, Italy

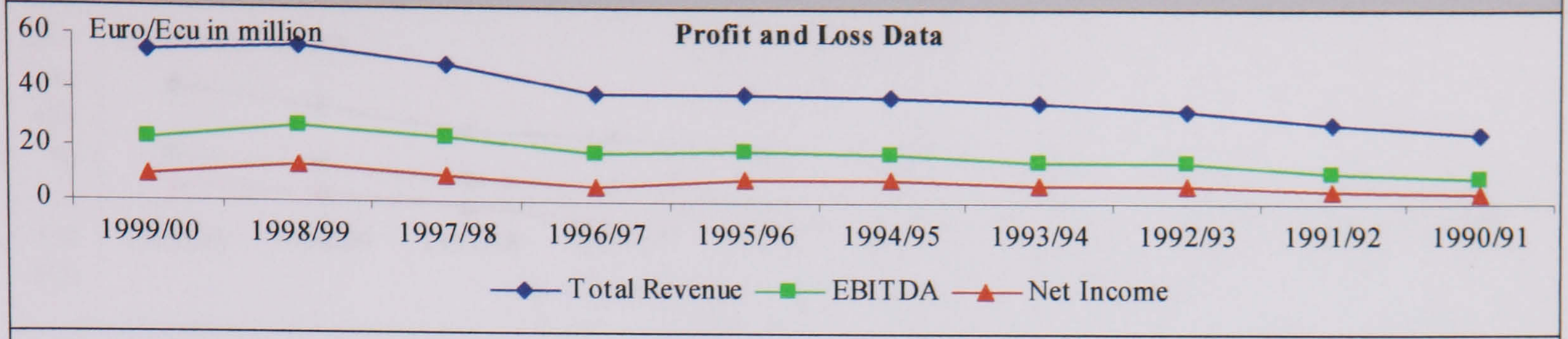


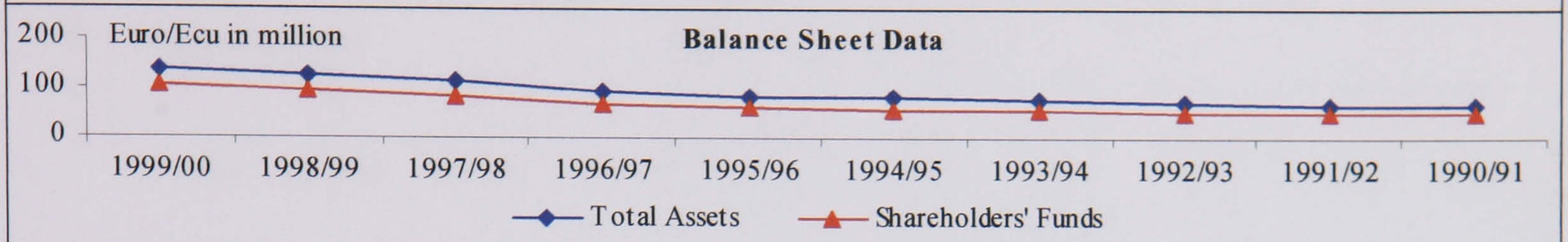



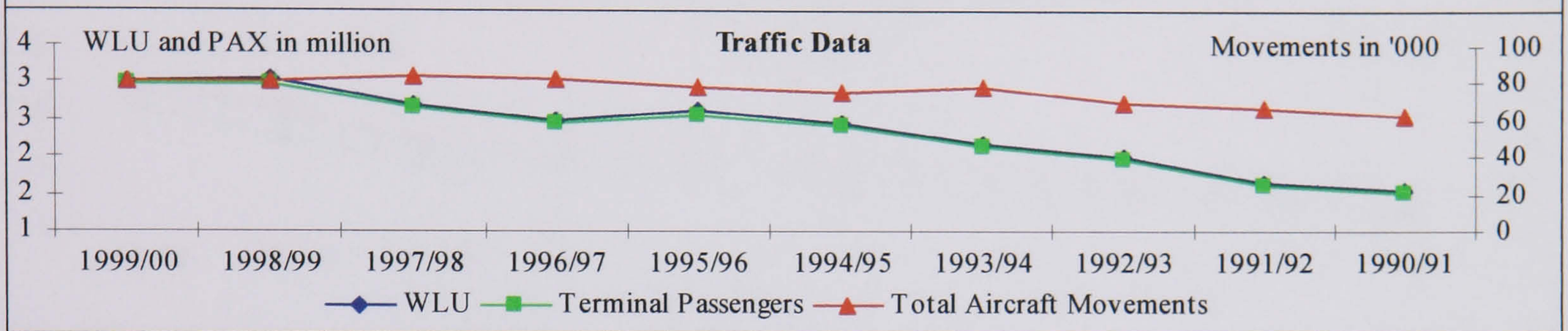



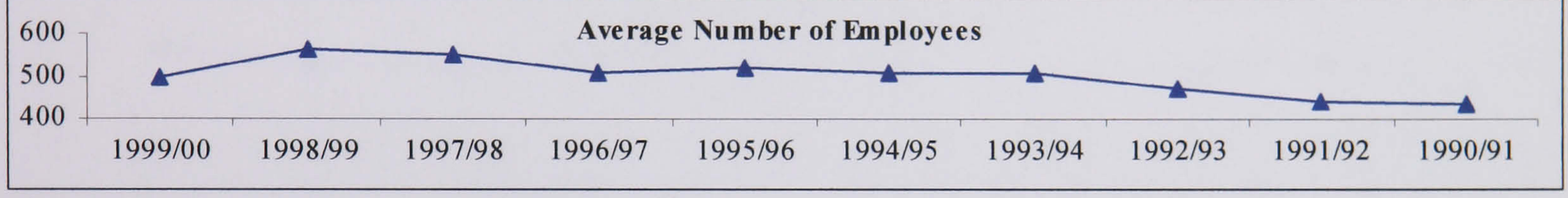



## NCL – Newcastle, UK

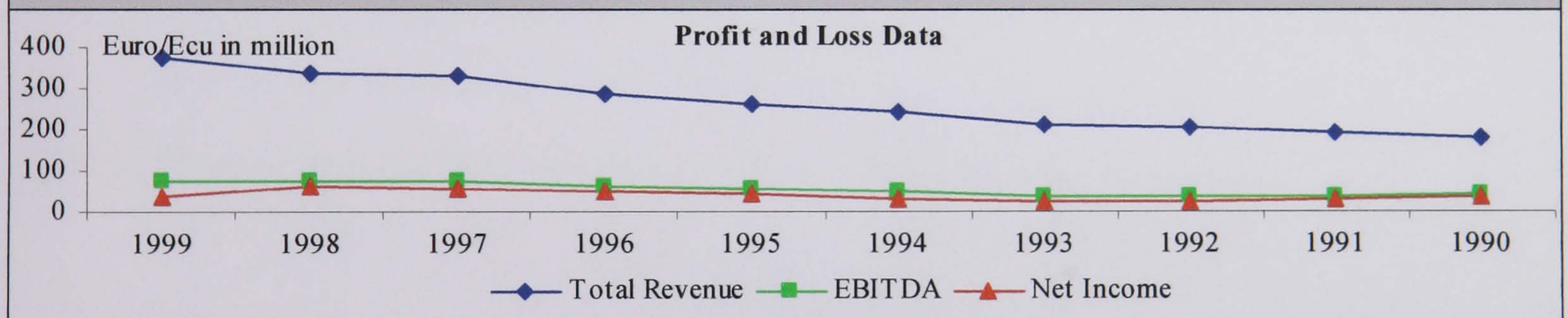


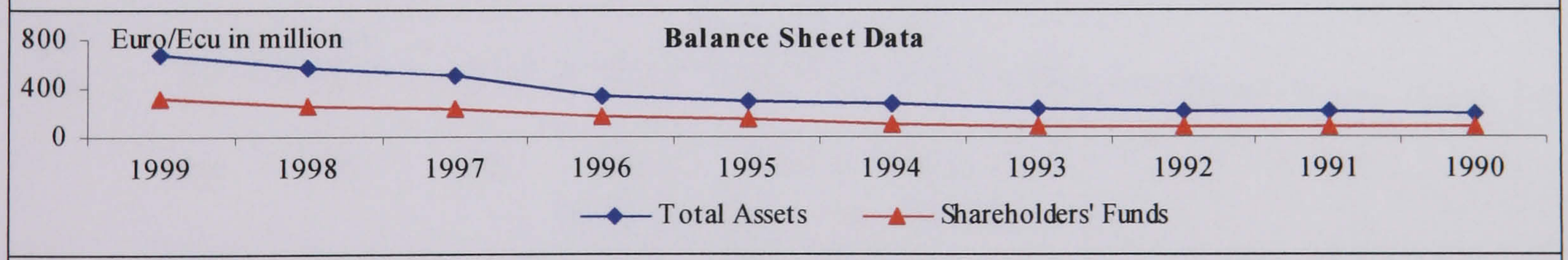



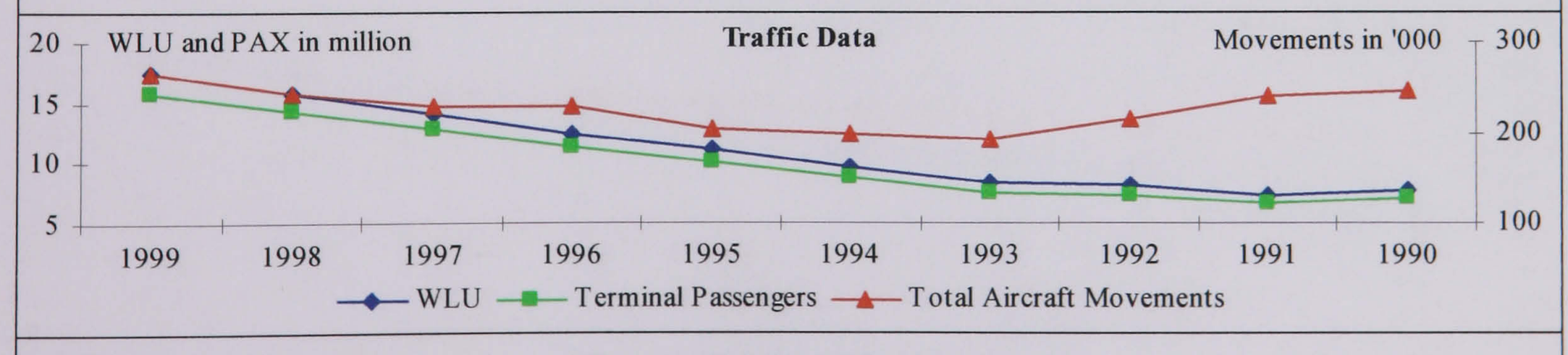



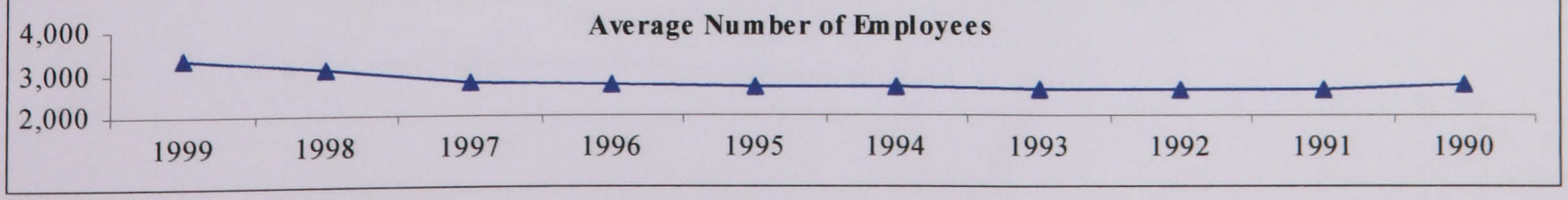




## RIA – AerRianta Group, Ireland

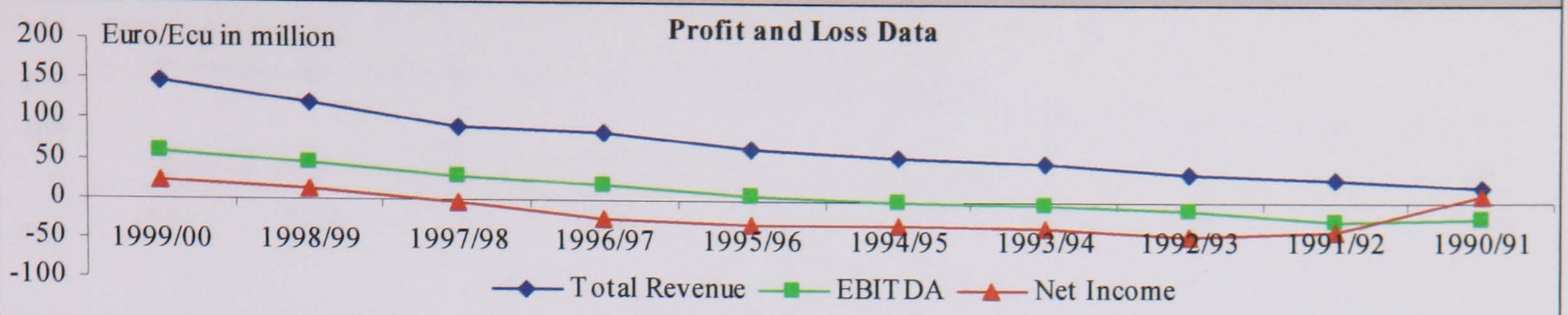


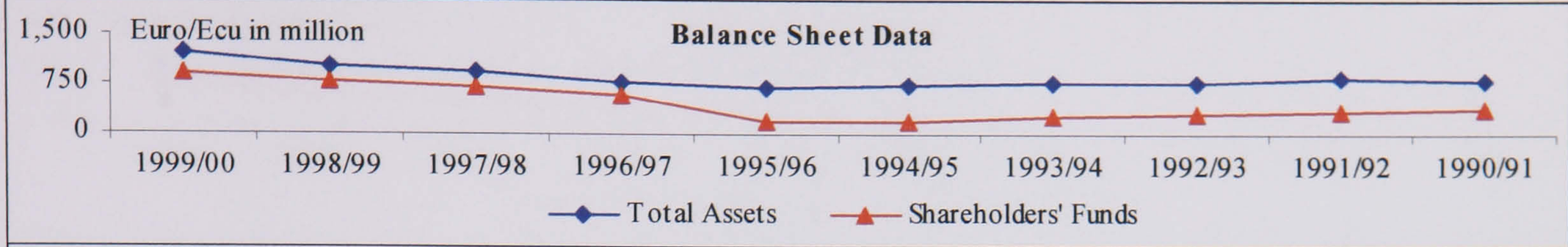



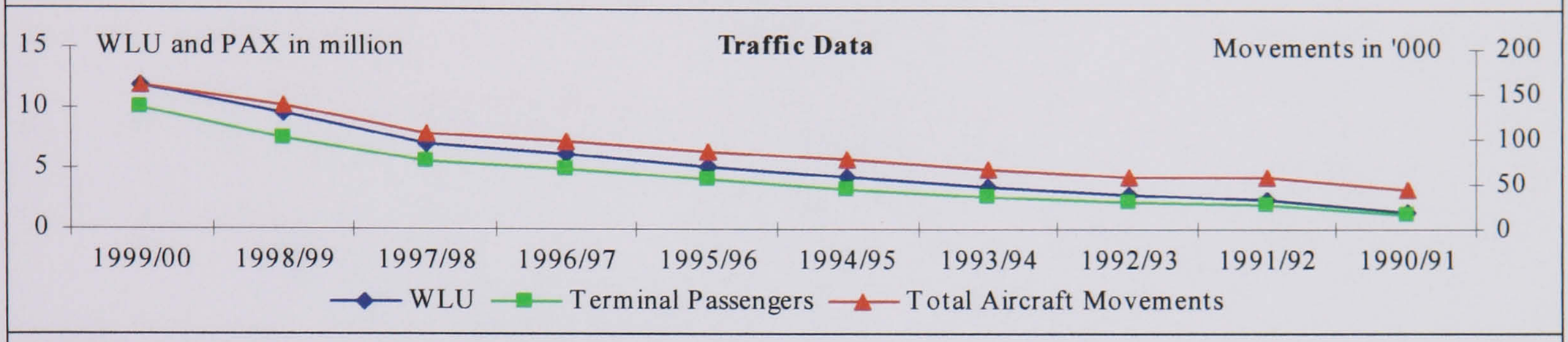



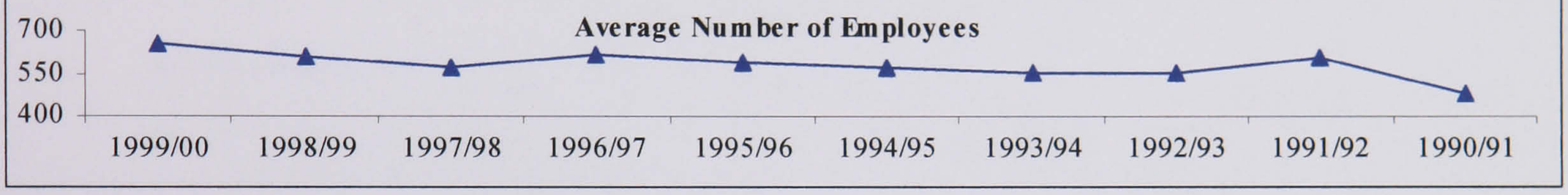



## STN – Stansted, UK

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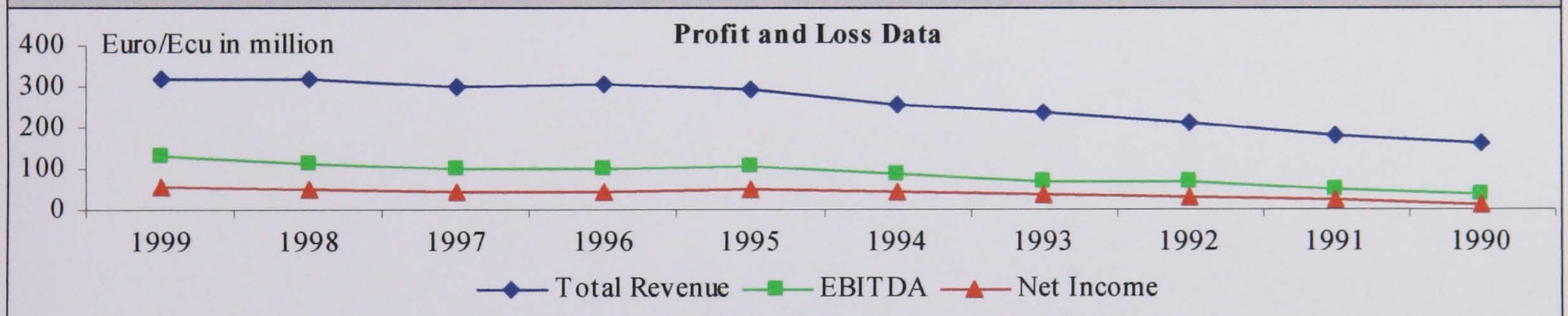
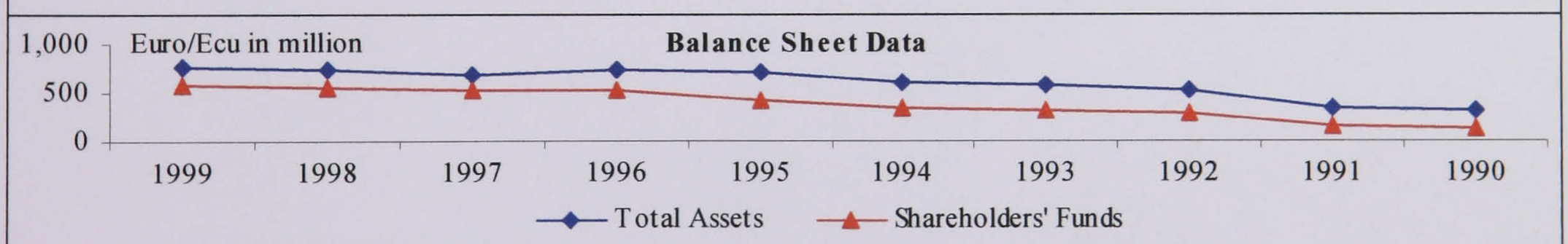
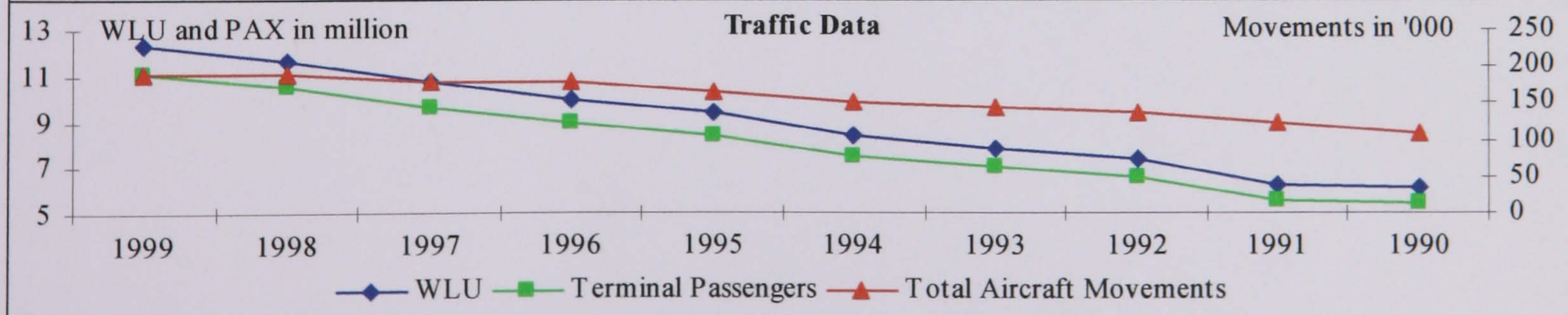
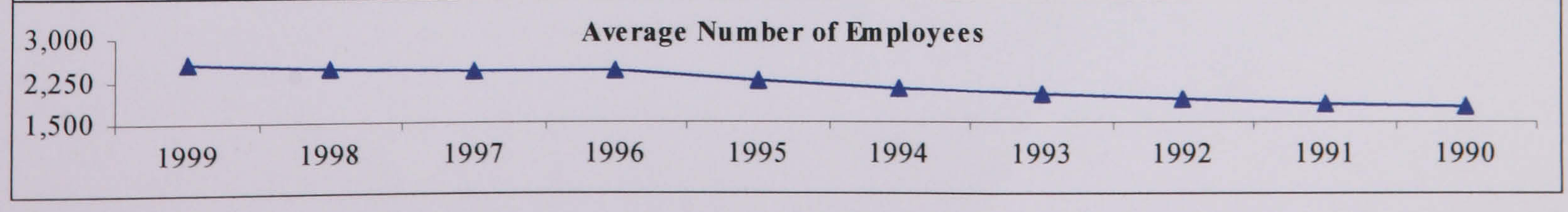
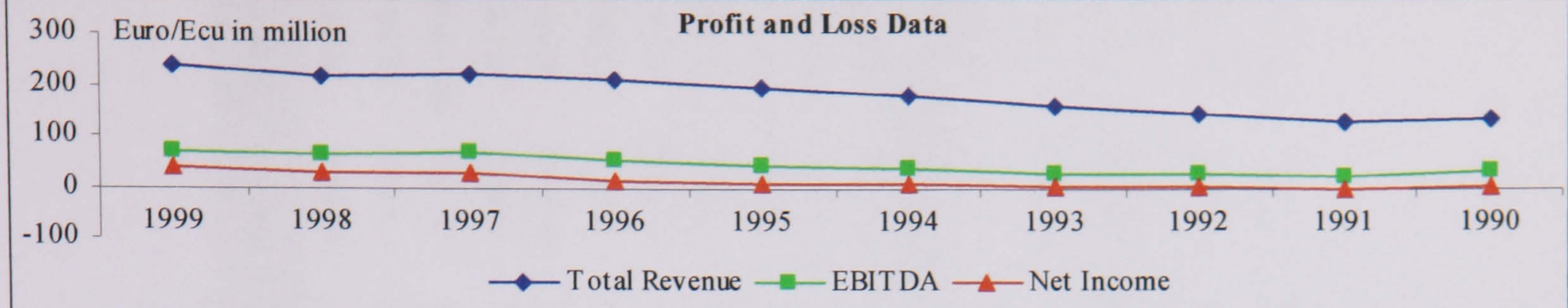


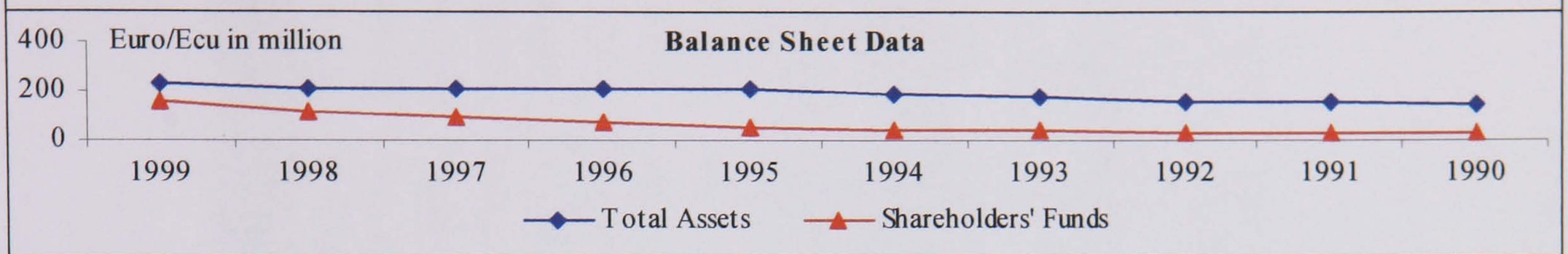



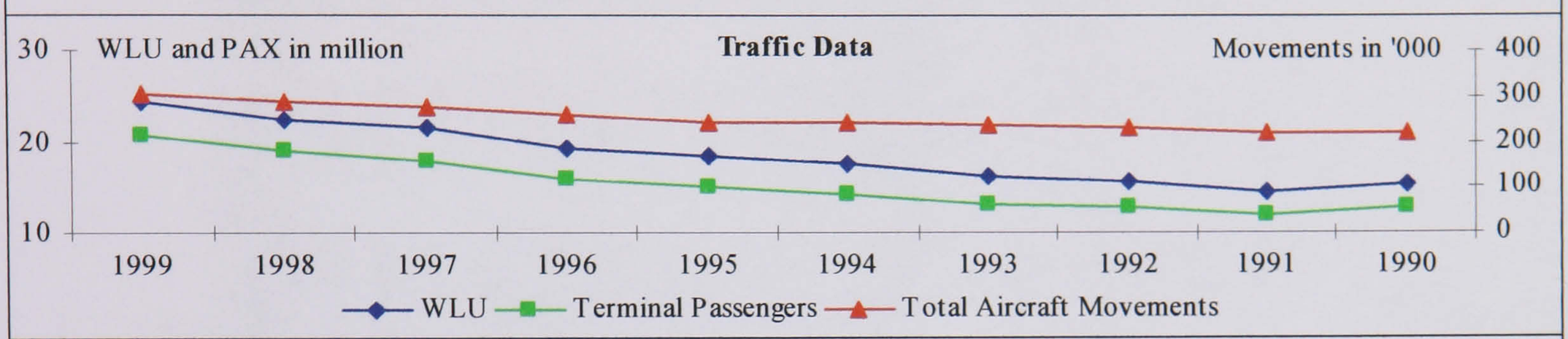



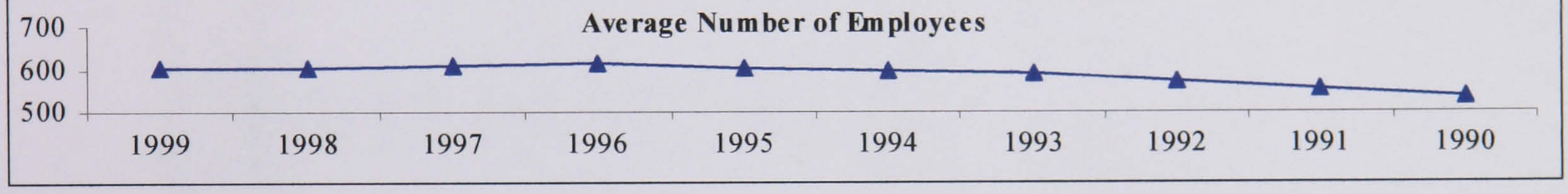



## ZRH – Zurich, Switzerland



## Appendix B.3: Results of Partial Factor Productivity

### ABZ – Aberdeen, UK

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 18.2% | 12.03 € | 11.30 € | 11.44 € | 10.70 € | 10.18 € | 10.64 € | 10.10 € | 9.31 € | 10.26 € | 10.18 € |
| Inflation-Adjusted Total Cost per WLU | -8.5% | 10.85 € | 10.36 € | 10.81 € | 10.45 € | 10.18 € | 10.98 € | 10.71 € | 10.04 € | 11.41 € | 11.86 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 4.76% | -4.20% | 3.47% | 2.58% | -7.24% | 2.48% | 6.67% | -12.00% | -3.77% | base year |
| Operating Cost per WLU | 12.9% | 10.44 € | 9.65 € | 9.23 € | 9.01 € | 8.92 € | 9.47 € | 8.99 € | 8.23 € | 9.46 € | 9.25 € |
| Inflation-Adjusted Operating Cost per WLU | -12.7% | 9.42 € | 8.84 € | 8.72 € | 8.80 € | 8.92 € | 9.78 € | 9.53 € | 8.88 € | 10.53 € | 10.79 € |
| Depreciation Cost per WLU | 119.0% | 1.09 € | 1.00 € | 0.98 € | 0.87 € | 0.72 € | 0.66 € | 0.55 € | 0.51 € | 0.67 € | 0.50 € |
| Inflation-Adjusted Depreciation Cost per WLU | 69.5% | 0.98 € | 0.91 € | 0.93 € | 0.85 € | 0.72 € | 0.68 € | 0.59 € | 0.55 € | 0.74 € | 0.58 € |
| Depreciation Share of Operating Cost | 94.0% | 10.45% | 10.33% | 10.62% | 9.66% | 8.04% | 6.99% | 6.14% | 6.18% | 7.05% | 5.39% |
| Labour Cost per WLU | 0.1% | 4.12 € | 4.04 € | 4.01 € | 3.69 € | 3.60 € | 3.50 € | 3.64 € | 3.70 € | 4.88 € | 4.12 € |
| Average Labour Cost per Employee | 46.1% | 45,098 € | 42,071 € | 39,545 € | 34,756 € | 31,381 € | 29,052 € | 32,010 € | 33,623 € | 37,548 € | 30,861 € |
| Labour Share of Operating Cost | -11.3% | 39.49% | 41.81% | 43.47% | 40.91% | 40.30% | 36.94% | 40.45% | 45.00% | 51.59% | 44.51% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 45.9% | 10,935 | 10,426 | 9,861 | 9,430 | 8,729 | 8,301 | 8,805 | 9,077 | 7,694 | 7,493 |
| Total Revenue per Employee | 89.8% | 178,889 € | 157,733 € | 146,693 € | 129,853 € | 110,792 € | 109,427 € | 114,505 € | 109,865 € | 96,538 € | 94,242 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -16.8% | 22 | 26 | 27 | 28 | 26 | 26 | 30 | 32 | 27 | 27 |
| Total Asset Turnover (Total Revenue / Total Assets) | 8.2% | 0.362 | 0.393 | 0.401 | 0.386 | 0.335 | 0.345 | 0.388 | 0.382 | 0.340 | 0.335 |
| Annual Growth Total Asset Turnover | | -7.87% | -1.99% | 3.85% | 15.43% | -2.97% | -11.17% | 1.57% | 12.55% | 1.41% | base year |

## ABZ – Aberdeen, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 30.1% | 16.36 € | 15.13 € | 14.88 € | 13.77 € | 12.69 € | 13.18 € | 13.00 € | 12.10 € | 12.55 € | 12.58 € |
| Inflation-Adjusted Total Revenue per WLU | 0.7% | 14.76 € | 13.86 € | 14.06 € | 13.45 € | 12.69 € | 13.61 € | 13.80 € | 13.06 € | 13.96 € | 14.66 € |
| Aeronautical Revenue per WLU | 22.0% | 9.88 € | 9.78 € | 10.11 € | 8.75 € | 8.08 € | 8.50 € | 8.72 € | 7.12 € | 8.85 € | 8.10 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -5.6% | 8.91 € | 8.97 € | 9.55 € | 8.55 € | 8.08 € | 8.78 € | 9.25 € | 7.68 € | 9.85 € | 9.44 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -0.6% | -6.2% | 11.8% | 5.8% | -8.0% | -5.1% | 20.4% | -22.0% | 4.4% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 71.6% | 244 € | 229 € | 235 € | 226 € | 187 € | 207 € | 178 € | 136 € | 178 € | 142 € |
| Aeronautical Revenue per Air Transport Movement | 55.7% | 309 € | 292 € | 309 € | 264 € | 237 € | 244 € | 227 € | 157 € | 218 € | 199 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 11.2% | 39.60% | 35.34% | 32.03% | 36.43% | 36.37% | 35.48% | 32.93% | 41.16% | 29.45% | 35.62% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 12.07% | 10.33% | -12.08% | 0.17% | 2.51% | 7.74% | -19.99% | 39.75% | -17.31% | base year |
| Commercial Revenue per Terminal Passenger | 58.6% | 6.26 € | 5.18 € | 4.79 € | 5.00 € | 4.62 € | 4.50 € | 4.01 € | 4.70 € | 3.07 € | 3.95 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 22.8% | 5.65 € | 4.74 € | 4.53 € | 4.88 € | 4.62 € | 4.65 € | 4.26 € | 5.07 € | 3.42 € | 4.60 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 10.1% | 1.360 | 1.339 | 1.300 | 1.287 | 1.246 | 1.239 | 1.288 | 1.300 | 1.223 | 1.236 |
| Annual Growth RevEx | | 1.61% | 2.96% | 1.03% | 3.27% | 0.56% | -3.75% | -0.95% | 6.27% | -1.02% | base year |
| Net Income per WLU | 80.4% | 4.33 € | 3.83 € | 3.44 € | 3.07 € | 2.51 € | 2.55 € | 2.91 € | 2.79 € | 2.29 € | 2.40 € |
| Return on Total Assets (ROA) | 50.0% | 9.60% | 9.96% | 9.27% | 8.62% | 6.62% | 6.66% | 8.68% | 8.83% | 6.20% | 6.40% |
| Operating Profit per WLU | 78.0% | 5.92 € | 5.48 € | 5.65 € | 4.76 € | 3.77 € | 3.71 € | 4.02 € | 3.87 € | 3.09 € | 3.32 € |
| Inflation-Adjusted Operating Profit per WLU | 37.7% | 5.34 € | 5.02 € | 5.34 € | 4.65 € | 3.77 € | 3.83 € | 4.26 € | 4.18 € | 3.44 € | 3.88 € |
| Return on Capital Employed (ROCE) | 48.0% | 13.11% | 14.24% | 15.25% | 13.36% | 9.95% | 9.71% | 12.00% | 12.24% | 8.36% | 8.86% |
| Annual Growth ROCE | | -7.98% | -6.58% | 14.11% | 34.27% | 2.51% | -19.11% | -1.93% | 46.38% | -5.61% | base year |

## ADP – Aeroports de Paris Group, France

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 24.7% | 15.52 € | 15.50 € | 14.94 € | 2.15 € | 15.98 € | 14.63 € | 15.03 € | 14.22 € | 13.76 € | 12.44 € |
| Inflation-Adjusted Total Cost per WLU | 6.9% | 14.83 € | 14.90 € | 14.47 € | 2.11 € | 15.98 € | 14.88 € | 15.56 € | 15.02 € | 14.88 € | 13.88 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -0.44% | 2.94% | 585.82% | -86.79% | 7.33% | -4.35% | 3.60% | 0.94% | 7.19% | base year |
| Operating Cost per WLU | 20.8% | 13.33 € | 13.27 € | 12.97 € | 13.28 € | 13.57 € | 12.86 € | 13.02 € | 12.23 € | 11.94 € | 11.04 € |
| Inflation-Adjusted Operating Cost per WLU | 3.4% | 12.75 € | 12.76 € | 12.57 € | 13.02 € | 13.57 € | 13.08 € | 13.48 € | 12.92 € | 12.91 € | 12.32 € |
| Depreciation Cost per WLU | 45.7% | 2.47 € | 2.38 € | 2.37 € | 2.28 € | 2.09 € | 2.17 € | 2.00 € | 1.79 € | 1.86 € | 1.69 € |
| Inflation-Adjusted Depreciation Cost per WLU | 24.8% | 2.36 € | 2.29 € | 2.29 € | 2.23 € | 2.09 € | 2.20 € | 2.07 € | 1.89 € | 2.01 € | 1.89 € |
| Depreciation Share of Operating Cost | 20.6% | 18.51% | 17.92% | 18.24% | 17.16% | 15.37% | 16.84% | 15.33% | 14.62% | 15.57% | 15.34% |
| Labour Cost per WLU | 21.9% | 5.77 € | 5.84 € | 5.73 € | 5.87 € | 6.00 € | 5.58 € | 5.60 € | 5.19 € | 5.25 € | 4.73 € |
| Average Labour Cost per Employee | 40.9% | 60,881 € | 58,172 € | 56,545 € | 57,540 € | 56,118 € | 53,685 € | 50,553 € | 46,363 € | 44,008 € | 43,217 € |
| Labour Share of Operating Cost | 1.0% | 43.27% | 44.02% | 44.14% | 44.22% | 44.24% | 43.36% | 43.01% | 42.41% | 43.98% | 42.86% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 15.5% | 10,551 | 9,958 | 9,877 | 9,795 | 9,348 | 9,626 | 9,028 | 8,937 | 8,379 | 9,133 |
| Total Revenue per Employee | 43.8% | 177,096 € | 164,682 € | 155,938 € | 158,730 € | 156,793 € | 151,236 € | 143,536 € | 139,271 € | 123,814 € | 123,173 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -36.6% | 25 | 25 | 26 | 26 | 25 | 28 | 28 | 29 | 35 | 40 |
| Total Asset Turnover (Total Revenue / Total Assets) | -21.1% | 0.423 | 0.415 | 0.417 | 0.427 | 0.427 | 0.443 | 0.446 | 0.456 | 0.523 | 0.537 |
| Annual Growth Total Asset Turnover | | 2.01% | -0.54% | -2.20% | -0.06% | -3.62% | -0.62% | -2.16% | -12.88% | -2.58% | base year |

## ADP – Aeroports de Paris Group, France

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 24.4% | 16.78 € | 16.54 € | 15.79 € | 16.20 € | 16.77 € | 15.71 € | 15.90 € | 15.58 € | 14.78 € | 13.49 € |
| Inflation-Adjusted Total Revenue per WLU | 6.6% | 16.05 € | 15.90 € | 15.30 € | 15.89 € | 16.77 € | 15.98 € | 16.46 € | 16.46 € | 15.97 € | 15.05 € |
| Aeronautical Revenue per WLU | 40.0% | 5.99 € | 5.48 € | 5.33 € | 5.40 € | 5.38 € | 5.17 € | 4.98 € | 4.78 € | 4.58 € | 4.28 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 19.9% | 5.73 € | 5.27 € | 5.16 € | 5.30 € | 5.38 € | 5.26 € | 5.16 € | 5.05 € | 4.95 € | 4.78 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 8.80% | 2.06% | -2.60% | -1.47% | 2.26% | 1.92% | 2.25% | 1.83% | 3.68% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 86.1% | 289 € | 266 € | 246 € | 256 € | 241 € | 224 € | 187 € | 171 € | 153 € | 155 € |
| Aeronautical Revenue per Air Transport Movement | 23.0% | 698 € | 630 € | 617 € | 635 € | 644 € | 655 € | 603 € | 574 € | 557 € | 568 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -5.8% | 64.29% | 66.88% | 66.27% | 66.65% | 67.94% | 67.10% | 68.65% | 69.34% | 68.99% | 68.26% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -3.87% | 0.92% | -0.57% | -1.90% | 1.25% | -2.26% | -0.99% | 0.51% | 1.07% | base year |
| Commercial Revenue per Terminal Passenger | 16.3% | 11.45 € | 9.89 € | 11.13 € | 11.34 € | 12.21 € | 11.27 € | 11.38 € | 11.12 € | 10.76 € | 9.85 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -0.4% | 10.95 € | 9.51 € | 10.79 € | 11.12 € | 12.21 € | 11.47 € | 11.78 € | 11.74 € | 11.64 € | 10.99 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -0.2% | 1.082 | 1.067 | 1.057 | 1.058 | 1.050 | 1.074 | 1.058 | 1.096 | 1.074 | 1.084 |
| Annual Growth RevEx | | 1.36% | 0.97% | -0.07% | 0.75% | -2.22% | 1.53% | -3.46% | 2.05% | -0.99% | base year |
| Net Income per WLU | 20.9% | 1.27 € | 1.04 € | 0.85 € | 0.88 € | 0.80 € | 1.08 € | 0.87 € | 1.36 € | 1.01 € | 1.05 € |
| Return on Total Assets (ROA) | -23.4% | 3.20% | 2.61% | 2.25% | 2.33% | 2.03% | 3.04% | 2.43% | 3.97% | 3.58% | 4.17% |
| Operating Profit per WLU | 41.1% | 3.45 € | 3.27 € | 2.82 € | 2.92 € | 3.20 € | 2.85 € | 2.88 € | 3.35 € | 2.83 € | 2.44 € |
| Inflation-Adjusted Operating Profit per WLU | 20.9% | 3.30 € | 3.14 € | 2.73 € | 2.86 € | 3.20 € | 2.90 € | 2.98 € | 3.54 € | 3.06 € | 2.73 € |
| Return on Capital Employed (ROCE) | -10.6% | 8.70% | 8.20% | 7.45% | 7.69% | 8.16% | 8.04% | 8.08% | 9.79% | 10.03% | 9.73% |
| Annual Growth ROCE | | 6.16% | 10.05% | -3.18% | -5.66% | 1.48% | -0.51% | -17.53% | -2.35% | 3.08% | base year |

## ADR – Aeroporti di Roma, Italy

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 6.1% | 21.63 € | 18.10 € | 19.99 € | 21.10 € | 19.71 € | 21.04 € | 21.13 € | 26.91 € | 27.48 € | 20.38 € |
| Inflation-Adjusted Total Cost per WLU | -24.7% | 19.66 € | 16.73 € | 18.84 € | 20.29 € | 19.71 € | 22.14 € | 23.14 € | 30.83 € | 33.15 € | 26.12 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 17.55% | -11.22% | -7.15% | 2.94% | -10.98% | -4.33% | -24.92% | -7.01% | 26.89% | base year |
| Operating Cost per WLU | -2.2% | 19.53 € | 16.51 € | 18.06 € | 19.05 € | 17.90 € | 19.45 € | 20.40 € | 26.50 € | 26.68 € | 19.97 € |
| Inflation-Adjusted Operating Cost per WLU | -30.6% | 17.75 € | 15.26 € | 17.02 € | 18.32 € | 17.90 € | 20.48 € | 22.34 € | 30.35 € | 32.19 € | 25.60 € |
| Depreciation Cost per WLU | -2.2% | 1.65 € | 1.22 € | 1.11 € | 1.26 € | 1.36 € | 1.32 € | 1.65 € | 2.01 € | 2.27 € | 1.69 € |
| Inflation-Adjusted Depreciation Cost per WLU | -30.7% | 1.50 € | 1.13 € | 1.05 € | 1.21 € | 1.36 € | 1.39 € | 1.81 € | 2.30 € | 2.73 € | 2.16 € |
| Depreciation Share of Operating Cost | 0.0% | 8.44% | 7.42% | 6.16% | 6.62% | 7.62% | 6.77% | 8.11% | 7.59% | 8.50% | 8.45% |
| Labour Cost per WLU | -24.6% | 8.11 € | 7.76 € | 9.15 € | 9.67 € | 9.96 € | 10.85 € | 11.44 € | 13.19 € | 13.81 € | 10.76 € |
| Average Labour Cost per Employee | 13.8% | 42,069 € | 41,360 € | 43,991 € | 41,101 € | 39,245 € | 40,107 € | 38,571 € | 43,628 € | 41,934 € | 36,983 € |
| Labour Share of Operating Cost | -22.9% | 41.53% | 47.00% | 50.65% | 50.76% | 55.64% | 55.76% | 56.10% | 49.79% | 51.74% | 53.90% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 50.9% | 5,187 | 5,331 | 4,809 | 4,250 | 3,940 | 3,698 | 3,371 | 3,306 | 3,037 | 3,437 |
| Total Revenue per Employee | 68.6% | 119,594 € | 107,039 € | 103,988 € | 97,106 € | 82,016 € | 80,552 € | 72,683 € | 89,683 € | 84,149 € | 70,933 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 40.7% | 38 | 46 | 53 | 51 | 54 | 57 | 57 | 19 | 19 | 27 |
| Total Asset Turnover (Total Revenue / Total Assets) | 57.1% | 0.870 | 0.926 | 1.150 | 1.154 | 1.120 | 1.236 | 1.235 | 0.528 | 0.525 | 0.554 |
| Annual Growth Total Asset Turnover | | -6.04% | -19.53% | -0.32% | 3.04% | -9.39% | 0.08% | 133.77% | 0.72% | -5.24% | base year |

## ADR – Aeroporti di Roma, Italy

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 11.7% | 23.06 € | 20.08 € | 21.63 € | 22.85 € | 20.82 € | 21.78 € | 21.56 € | 27.12 € | 27.71 € | 20.64 € |
| Inflation-Adjusted Total Revenue per WLU | -20.8% | 20.96 € | 18.56 € | 20.38 € | 21.97 € | 20.82 € | 22.93 € | 23.62 € | 31.07 € | 33.42 € | 26.46 € |
| Aeronautical Revenue per WLU | 13.1% | 12.74 € | 11.00 € | 11.14 € | 11.30 € | 10.66 € | 10.98 € | 11.34 € | 13.22 € | 13.10 € | 11.27 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -19.8% | 11.58 € | 10.17 € | 10.50 € | 10.87 € | 10.66 € | 11.56 € | 12.43 € | 15.15 € | 15.81 € | 14.45 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 13.87% | -3.11% | -3.41% | 1.92% | -7.76% | -6.96% | -17.97% | -4.17% | 9.42% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 4.5% | 1,170 € | 1,109 € | 1,166 € | 1,145 € | 1,108 € | 1,151 € | 1,151 € | 1,319 € | 1,206 € | 1,120 € |
| Aeronautical Revenue per Air Transport Movement | -6.2% | 1,226 € | 1,162 € | 1,223 € | 1,208 € | 1,187 € | 1,236 € | 1,251 € | 1,477 € | 1,440 € | 1,307 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -1.5% | 44.75% | 45.20% | 48.50% | 50.53% | 48.77% | 49.58% | 47.39% | 51.25% | 52.71% | 45.41% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -1.00% | -6.80% | -4.03% | 3.61% | -1.64% | 4.64% | -7.53% | -2.77% | 16.06% | base year |
| Commercial Revenue per Terminal Passenger | 4.7% | 9.30 € | 9.38 € | 11.51 € | 12.62 € | 11.56 € | 12.41 € | 11.80 € | 13.44 € | 14.51 € | 8.88 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -25.8% | 8.45 € | 8.67 € | 10.85 € | 12.13 € | 11.56 € | 13.06 € | 12.93 € | 15.39 € | 17.50 € | 11.39 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 5.2% | 1.066 | 1.109 | 1.082 | 1.083 | 1.056 | 1.036 | 1.020 | 1.008 | 1.008 | 1.013 |
| Annual Growth RevEx | | -3.92% | 2.55% | -0.09% | 2.53% | 1.97% | 1.49% | 1.24% | -0.03% | -0.47% | base year |
| Net Income per WLU | 437.6% | 1.43 € | 1.98 € | 1.64 € | 1.75 € | 1.10 € | 0.75 € | 0.43 € | 0.21 € | 0.23 € | 0.27 € |
| Return on Total Assets (ROA) | 656.2% | 5.39% | 9.13% | 8.70% | 8.82% | 5.95% | 4.25% | 2.47% | 0.42% | 0.43% | 0.71% |
| Operating Profit per WLU | 423.3% | 3.53 € | 3.57 € | 3.56 € | 3.80 € | 2.92 € | 2.33 € | 1.16 € | 0.62 € | 1.02 € | 0.67 € |
| Inflation-Adjusted Operating Profit per WLU | 271.1% | 3.21 € | 3.30 € | 3.36 € | 3.65 € | 2.92 € | 2.45 € | 1.28 € | 0.72 € | 1.23 € | 0.86 € |
| Return on Capital Employed (ROCE) | 636.2% | 13.31% | 16.46% | 18.95% | 19.18% | 15.69% | 13.23% | 6.67% | 1.22% | 1.94% | 1.81% |
| Annual Growth ROCE | | -19.18% | -13.13% | -1.17% | 22.21% | 18.57% | 98.33% | 448.64% | -37.17% | 7.08% | base year |

## AMS – Schiphol Group (Amsterdam), Netherlands — Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -13.6% | 9.27 € | 8.81 € | 8.91 € | 9.71 € | 9.83 € | 11.14 € | 11.94 € | 11.10 € | 11.31 € | 10.73 € |
| Inflation-Adjusted Total Cost per WLU | -30.5% | 8.53 € | 8.29 € | 8.55 € | 9.52 € | 9.83 € | 11.35 € | 12.52 € | 11.94 € | 12.54 € | 12.27 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 2.97% | -3.06% | -10.17% | -3.16% | -13.46% | -9.31% | 4.87% | -4.80% | 2.18% | base year |
| Operating Cost per WLU | -18.2% | 8.24 € | 8.33 € | 8.50 € | 8.80 € | 8.97 € | 10.30 € | 10.86 € | 10.24 € | 10.53 € | 10.08 € |
| Inflation-Adjusted Operating Cost per WLU | -34.2% | 7.59 € | 7.83 € | 8.16 € | 8.63 € | 8.97 € | 10.50 € | 11.38 € | 11.01 € | 11.67 € | 11.53 € |
| Depreciation Cost per WLU | -33.3% | 1.58 € | 2.05 € | 2.13 € | 2.32 € | 2.46 € | 2.88 € | 2.48 € | 2.61 € | 2.56 € | 2.37 € |
| Inflation-Adjusted Depreciation Cost per WLU | -46.3% | 1.45 € | 1.93 € | 2.04 € | 2.27 € | 2.46 € | 2.94 € | 2.59 € | 2.80 € | 2.84 € | 2.71 € |
| Depreciation Share of Operating Cost | -18.5% | 19.15% | 24.67% | 25.05% | 26.30% | 27.43% | 28.01% | 22.80% | 25.46% | 24.32% | 23.48% |
| Labour Cost per WLU | -45.8% | 1.91 € | 1.92 € | 2.35 € | 2.60 € | 2.59 € | 3.07 € | 3.40 € | 3.58 € | 3.60 € | 3.52 € |
| Average Labour Cost per Employee | 48.2% | 50,645 € | 46,870 € | 57,194 € | 58,962 € | 54,638 € | 45,897 € | 45,344 € | 43,397 € | 37,943 € | 34,172 € |
| Labour Share of Operating Cost | -33.7% | 23.14% | 23.08% | 27.63% | 29.48% | 28.90% | 29.79% | 31.28% | 34.95% | 34.19% | 34.91% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 173.4% | 26,564 | 24,391 | 24,353 | 22,721 | 21,070 | 14,964 | 13,356 | 12,131 | 10,541 | 9,714 |
| Total Revenue per Employee | 175.0% | 314,198 € | 284,435 € | 278,884 € | 268,035 € | 247,898 € | 192,125 € | 179,893 € | 152,825 € | 130,762 € | 114,259 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -18.2% | 22 | 25 | 26 | 24 | 23 | 22 | 21 | 24 | 24 | 27 |
| Total Asset Turnover (Total Revenue / Total Assets) | -17.7% | 0.266 | 0.286 | 0.293 | 0.282 | 0.273 | 0.284 | 0.289 | 0.298 | 0.297 | 0.323 |
| Annual Growth Total Asset Turnover | | -7.05% | -2.54% | 3.93% | 3.46% | -3.94% | -1.75% | -3.15% | 0.45% | -8.00% | base year |

## AMS – Schiphol Group (Amsterdam), Netherlands — Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 0.6% | 11.83 € | 11.66 € | 11.45 € | 11.80 € | 11.77 € | 12.84 € | 13.47 € | 12.60 € | 12.41 € | 11.76 € |
| Inflation-Adjusted Total Revenue per WLU | -19.1% | 10.89 € | 10.97 € | 10.99 € | 11.57 € | 11.77 € | 13.09 € | 14.12 € | 13.55 € | 13.75 € | 13.46 € |
| Aeronautical Revenue per WLU | 26.4% | 5.78 € | 5.34 € | 5.05 € | 5.31 € | 5.25 € | 5.21 € | 5.29 € | 5.15 € | 4.84 € | 4.57 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 1.7% | 5.32 € | 5.03 € | 4.85 € | 5.20 € | 5.25 € | 5.31 € | 5.55 € | 5.53 € | 5.37 € | 5.23 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 5.93% | 3.69% | -6.87% | -0.96% | -1.14% | -4.21% | 0.27% | 3.01% | 2.64% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 42.4% | 417 € | 390 € | 360 € | 365 € | 335 € | 309 € | 292 € | 353 € | 321 € | 293 € |
| Aeronautical Revenue per Air Transport Movement | 38.5% | 671 € | 614 € | 596 € | 610 € | 609 € | 588 € | 559 € | 536 € | 513 € | 484 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -16.3% | 51.12% | 54.19% | 55.91% | 55.01% | 55.34% | 59.39% | 60.71% | 59.16% | 60.95% | 61.11% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -5.66% | -3.06% | 1.63% | -0.61% | -6.82% | -2.16% | 2.62% | -2.94% | -0.27% | base year |
| Commercial Revenue per Terminal Passenger | -20.1% | 6.47 € | 6.96 € | 7.10 € | 7.47 € | 7.35 € | 8.66 € | 8.87 € | 8.39 € | 8.52 € | 8.10 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -35.7% | 5.96 € | 6.55 € | 6.81 € | 7.32 € | 7.35 € | 8.82 € | 9.30 € | 9.02 € | 9.45 € | 9.27 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 16.4% | 1.277 | 1.324 | 1.286 | 1.215 | 1.197 | 1.153 | 1.128 | 1.135 | 1.097 | 1.097 |
| Annual Growth RevEx | | -3.58% | 2.97% | 5.78% | 1.51% | 3.88% | 2.21% | -0.62% | 3.46% | 0.02% | base year |
| Net Income per WLU | 147.3% | 2.56 € | 2.85 € | 2.55 € | 2.09 € | 1.94 € | 1.70 € | 1.53 € | 1.50 € | 1.10 € | 1.04 € |
| Return on Total Assets (ROA) | 102.3% | 5.76% | 6.99% | 6.52% | 5.00% | 4.50% | 3.76% | 3.28% | 3.54% | 2.62% | 2.84% |
| Operating Profit per WLU | 112.7% | 3.59 € | 3.34 € | 2.95 € | 2.99 € | 2.79 € | 2.54 € | 2.61 € | 2.36 € | 1.88 € | 1.69 € |
| Inflation-Adjusted Operating Profit per WLU | 71.2% | 3.30 € | 3.14 € | 2.83 € | 2.94 € | 2.79 € | 2.59 € | 2.74 € | 2.54 € | 2.08 € | 1.93 € |
| Return on Capital Employed (ROCE) | 74.1% | 8.06% | 8.18% | 7.56% | 7.16% | 6.48% | 5.63% | 5.61% | 5.59% | 4.50% | 4.63% |
| Annual Growth ROCE | | -1.45% | 8.20% | 5.51% | 10.61% | 15.12% | 0.28% | 0.27% | 24.39% | -2.85% | base year |

## BAA Group, UK

## Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 90.9% | 21.08 € | 17.37 € | 16.91 € | 12.04 € | 10.26 € | 10.84 € | 11.79 € | 10.87 € | 12.96 € | 11.05 € |
| Inflation-Adjusted Total Cost per WLU | 47.7% | 19.02 € | 15.92 € | 15.98 € | 11.76 € | 10.26 € | 11.19 € | 12.51 € | 11.72 € | 14.42 € | 12.88 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 19.46% | -0.36% | 35.91% | 14.60% | -8.28% | -10.57% | 6.67% | -18.72% | 12.04% | base year |
| Operating Cost per WLU | 93.6% | 19.46 € | 15.39 € | 13.97 € | 9.86 € | 8.86 € | 9.33 € | 10.03 € | 9.21 € | 11.35 € | 10.05 € |
| Inflation-Adjusted Operating Cost per WLU | 49.9% | 17.56 € | 14.11 € | 13.20 € | 9.63 € | 8.86 € | 9.63 € | 10.64 € | 9.94 € | 12.63 € | 11.72 € |
| Depreciation Cost per WLU | 139.9% | 2.37 € | 2.04 € | 1.62 € | 1.23 € | 1.09 € | 1.11 € | 1.15 € | 1.22 € | 1.33 € | 0.99 € |
| Inflation-Adjusted Depreciation Cost per WLU | 85.7% | 2.13 € | 1.87 € | 1.53 € | 1.20 € | 1.09 € | 1.14 € | 1.22 € | 1.31 € | 1.47 € | 1.15 € |
| Depreciation Share of Operating Cost | 23.9% | 12.16% | 13.23% | 11.57% | 12.47% | 12.35% | 11.87% | 11.51% | 13.22% | 11.68% | 9.81% |
| Labour Cost per WLU | 12.2% | 4.31 € | 4.02 € | 3.58 € | 2.75 € | 2.60 € | 2.83 € | 3.01 € | 3.19 € | 3.86 € | 3.85 € |
| Average Labour Cost per Employee | 54.9% | 45,373 € | 41,430 € | 35,569 € | 37,494 € | 34,551 € | 35,561 € | 33,663 € | 33,868 € | 30,970 € | 29,285 € |
| Labour Share of Operating Cost | -42.1% | 22.16% | 26.10% | 25.65% | 27.89% | 29.38% | 30.34% | 30.00% | 34.65% | 34.04% | 38.26% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 38.1% | 10,517 | 10,312 | 9,929 | 13,634 | 13,273 | 12,557 | 11,187 | 10,612 | 8,017 | 7,613 |
| Total Revenue per Employee | 132.3% | 252,588 € | 224,826 € | 201,081 € | 209,266 € | 181,898 € | 179,197 € | 168,777 € | 148,173 € | 125,120 € | 108,743 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -34.9% | 12 | 13 | 13 | 16 | 19 | 19 | 19 | 21 | 19 | 19 |
| Total Asset Turnover (Total Revenue / Total Assets) | 9.4% | 0.292 | 0.279 | 0.261 | 0.250 | 0.256 | 0.271 | 0.287 | 0.289 | 0.293 | 0.267 |
| Annual Growth Total Asset Turnover | | 4.43% | 7.04% | 4.49% | -2.55% | -5.56% | -5.44% | -0.77% | -1.16% | 9.73% | base year |

## BAA Group, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 68.1% | 24.02 € | 21.80 € | 20.25 € | 15.35 € | 13.70 € | 14.27 € | 15.09 € | 13.96 € | 15.61 € | 14.28 € |
| Inflation-Adjusted Total Revenue per WLU | 30.1% | 21.67 € | 19.98 € | 19.14 € | 14.99 € | 13.70 € | 14.73 € | 16.00 € | 15.06 € | 17.37 € | 16.65 € |
| Aeronautical Revenue per WLU | 29.1% | 7.18 € | 6.46 € | 6.19 € | 5.33 € | 4.82 € | 4.83 € | 5.04 € | 5.39 € | 6.21 € | 5.56 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -0.1% | 6.48 € | 5.92 € | 5.85 € | 5.20 € | 4.82 € | 4.99 € | 5.35 € | 5.81 € | 6.91 € | 6.48 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 9.36% | 1.24% | 12.47% | 7.96% | -3.36% | -6.82% | -7.95% | -15.91% | 6.65% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 94.5% | 797 € | 697 € | 650 € | 548 € | 485 € | 466 € | 456 € | 462 € | 468 € | 410 € |
| Aeronautical Revenue per Air Transport Movement | 50.8% | 882 € | 786 € | 744 € | 626 € | 566 € | 554 € | 550 € | 568 € | 633 € | 584 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 14.8% | 70.10% | 70.35% | 69.42% | 65.29% | 64.84% | 66.15% | 66.57% | 61.41% | 60.20% | 61.07% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -0.36% | 1.34% | 6.33% | 0.70% | -1.99% | -0.62% | 8.40% | 2.01% | -1.42% | base year |
| Commercial Revenue per Terminal Passenger | 109.8% | 17.25 € | 16.42 € | 15.29 € | 10.54 € | 9.49 € | 10.11 € | 10.22 € | 8.32 € | 8.73 € | 8.22 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 62.4% | 15.56 € | 15.05 € | 14.44 € | 10.29 € | 9.49 € | 10.44 € | 10.84 € | 8.98 € | 9.71 € | 9.58 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -11.9% | 1.139 | 1.255 | 1.198 | 1.275 | 1.336 | 1.317 | 1.280 | 1.285 | 1.204 | 1.293 |
| Annual Growth RevEx | | -9.23% | 4.79% | -6.06% | -4.57% | 1.43% | 2.92% | -0.39% | 6.71% | -6.89% | base year |
| Net Income per WLU | -9.4% | 2.93 € | 4.43 € | 3.34 € | 3.31 € | 3.45 € | 3.44 € | 3.30 € | 3.09 € | 2.64 € | 3.24 € |
| Return on Total Assets (ROA) | -41.0% | 3.56% | 5.68% | 4.31% | 5.39% | 6.44% | 6.53% | 6.27% | 6.41% | 4.96% | 6.04% |
| Operating Profit per WLU | 7.6% | 4.55 € | 6.41 € | 6.28 € | 5.49 € | 4.85 € | 4.94 € | 5.06 € | 4.75 € | 4.26 € | 4.23 € |
| Inflation-Adjusted Operating Profit per WLU | -16.7% | 4.11 € | 5.88 € | 5.94 € | 5.36 € | 4.85 € | 5.10 € | 5.36 € | 5.13 € | 4.74 € | 4.93 € |
| Return on Capital Employed (ROCE) | -30.0% | 5.53% | 8.22% | 8.10% | 8.93% | 9.06% | 9.39% | 9.62% | 9.85% | 7.98% | 7.90% |
| Annual Growth ROCE | | -32.69% | 1.43% | -9.33% | -1.43% | -3.49% | -2.39% | -2.28% | 23.30% | 1.08% | base year |

## BER – Berlin Group, Germany

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 94-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -25.3% | 13.52 € | 18.53 € | 15.34 € | 16.91 € | 17.39 € | 18.10 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted Total Cost per WLU | -30.0% | 12.89 € | 17.76 € | 14.85 € | 16.68 € | 17.39 € | 18.41 € | n/a | n/a | n/a | n/a |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -27.45% | 19.64% | -10.95% | -4.12% | -5.54% | base year | n/a | n/a | n/a | n/a |
| Operating Cost per WLU | -24.5% | 12.43 € | 14.55 € | 13.76 € | 16.17 € | 15.04 € | 16.47 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted Operating Cost per WLU | -29.3% | 11.85 € | 13.95 € | 13.32 € | 15.94 € | 15.04 € | 16.75 € | n/a | n/a | n/a | n/a |
| Depreciation Cost per WLU | -7.3% | 2.37 € | 3.78 € | 2.79 € | 3.16 € | 2.56 € | 2.56 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted Depreciation Cost per WLU | -13.1% | 2.26 € | 3.63 € | 2.70 € | 3.12 € | 2.56 € | 2.60 € | n/a | n/a | n/a | n/a |
| Depreciation Share of Operating Cost | 22.9% | 19.10% | 26.00% | 20.27% | 19.56% | 17.03% | 15.55% | n/a | n/a | n/a | n/a |
| Labour Cost per WLU | -17.3% | 5.69 € | 5.89 € | 6.13 € | 6.95 € | 6.86 € | 6.89 € | n/a | n/a | n/a | n/a |
| Average Labour Cost per Employee | 29.7% | 45,446 € | 42,332 € | 39,199 € | 38,826 € | 37,603 € | 35,052 € | n/a | n/a | n/a | n/a |
| Labour Share of Operating Cost | 9.6% | 45.82% | 40.48% | 44.56% | 42.96% | 45.61% | 41.82% | n/a | n/a | n/a | n/a |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 56.8% | 7,982 | 7,187 | 6,393 | 5,590 | 5,483 | 5,090 | n/a | n/a | n/a | n/a |
| Total Revenue per Employee | 41.6% | 105,070 € | 97,250 € | 91,981 € | 83,724 € | 83,070 € | 74,213 € | n/a | n/a | n/a | n/a |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 36.0% | 22 | 21 | 20 | 17 | 17 | 16 | n/a | n/a | n/a | n/a |
| Total Asset Turnover (Total Revenue / Total Assets) | 22.8% | 0.286 | 0.291 | 0.285 | 0.254 | 0.252 | 0.233 | n/a | n/a | n/a | n/a |
| Annual Growth Total Asset Turnover | | -1.63% | 1.98% | 12.23% | 0.96% | 8.04% | base year | n/a | n/a | n/a | n/a |

## BER – Berlin Group, Germany

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | Growth 94-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -9.7% | 13.16 € | 13.53 € | 14.39 € | 14.98 € | 15.15 € | 14.58 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted Total Revenue per WLU | -15.4% | 12.55 € | 12.97 € | 13.93 € | 14.77 € | 15.15 € | 14.83 € | n/a | n/a | n/a | n/a |
| Aeronautical Revenue per WLU | 4.0% | 7.51 € | 6.57 € | 6.82 € | 7.10 € | 7.11 € | 7.22 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted Aeronautical Revenue per WLU | -2.6% | 7.16 € | 6.30 € | 6.60 € | 7.00 € | 7.11 € | 7.34 € | n/a | n/a | n/a | n/a |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 13.63% | -4.57% | -5.71% | -1.52% | -3.24% | base year | n/a | n/a | n/a | n/a |
| Aeronautical Revenue per Total Aircraft Movement | 23.0% | 437 € | 360 € | 362 € | 365 € | 364 € | 355 € | n/a | n/a | n/a | n/a |
| Aeronautical Revenue per Air Transport Movement | 19.3% | 510 € | 422 € | 428 € | 430 € | 439 € | 428 € | n/a | n/a | n/a | n/a |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -14.9% | 42.98% | 51.46% | 52.62% | 52.62% | 53.09% | 50.48% | n/a | n/a | n/a | n/a |
| Annual Growth Non-Aeron. Share of Total Revenue | | -16.49% | -2.21% | 0.01% | -0.90% | 5.17% | base year | n/a | n/a | n/a | n/a |
| Commercial Revenue per Terminal Passenger | -20.0% | 5.51 € | 6.71 € | 6.93 € | 7.54 € | 7.12 € | 6.88 € | n/a | n/a | n/a | n/a |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -25.0% | 5.25 € | 6.44 € | 6.71 € | 7.44 € | 7.12 € | 7.00 € | n/a | n/a | n/a | n/a |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 20.9% | 0.974 | 0.730 | 0.938 | 0.886 | 0.871 | 0.806 | n/a | n/a | n/a | n/a |
| Annual Growth RevEx | | 33.31% | -22.14% | 5.90% | 1.69% | 8.14% | base year | n/a | n/a | n/a | n/a |
| Net Income per WLU | 89.9% | -0.36 € | -5.00 € | -0.95 € | -1.93 € | -2.24 € | -3.52 € | n/a | n/a | n/a | n/a |
| Return on Total Assets (ROA) | 86.2% | -0.78% | -10.73% | -1.88% | -3.28% | -3.72% | -5.62% | n/a | n/a | n/a | n/a |
| Operating Profit per WLU | 139.0% | 0.74 € | -1.02 € | 0.63 € | -1.19 € | 0.11 € | -1.89 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted Operating Profit per WLU | 136.6% | 0.70 € | -0.98 € | 0.61 € | -1.17 € | 0.11 € | -1.92 € | n/a | n/a | n/a | n/a |
| Return on Capital Employed (ROCE) | 153.1% | 1.60% | -2.19% | 1.24% | -2.02% | 0.19% | -3.01% | n/a | n/a | n/a | n/a |
| Annual Growth ROCE | | 173.12% | -276.00% | 161.65% | -1175.03% | 106.22% | base year | n/a | n/a | n/a | n/a |

## BFS – Belfast, UK

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -10.0% | 8.87 € | 9.29 € | 8.34 € | 8.16 € | 9.57 € | 11.07 € | 10.19 € | 10.52 € | 10.79 € | 9.86 € |
| Inflation-Adjusted Total Cost per WLU | -30.3% | 8.00 € | 8.52 € | 7.88 € | 7.97 € | 9.57 € | 11.43 € | 10.81 € | 11.35 € | 12.01 € | 11.49 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -6.05% | 8.12% | -1.10% | -16.78% | -16.22% | 5.67% | -4.75% | -5.48% | 4.55% | base year |
| Operating Cost per WLU | -7.4% | 8.83 € | 7.81 € | 7.99 € | 7.51 € | 7.80 € | 9.87 € | 9.77 € | 10.72 € | 10.65 € | 9.54 € |
| Inflation-Adjusted Operating Cost per WLU | -28.3% | 7.97 € | 7.15 € | 7.55 € | 7.34 € | 7.80 € | 10.18 € | 10.37 € | 11.57 € | 11.85 € | 11.12 € |
| Depreciation Cost per WLU | -49.2% | 0.44 € | 0.43 € | 0.54 € | 0.27 € | 0.49 € | 0.60 € | 0.58 € | 0.81 € | 0.88 € | 0.87 € |
| Inflation-Adjusted Depreciation Cost per WLU | -60.7% | 0.40 € | 0.39 € | 0.51 € | 0.26 € | 0.49 € | 0.62 € | 0.62 € | 0.87 € | 0.98 € | 1.01 € |
| Depreciation Share of Operating Cost | -45.2% | 4.99% | 5.46% | 6.71% | 3.58% | 6.33% | 6.08% | 5.98% | 7.51% | 8.23% | 9.10% |
| Labour Cost per WLU | -19.5% | 3.18 € | 2.92 € | 3.04 € | 3.01 € | 2.80 € | 3.35 € | 3.42 € | 4.00 € | 4.40 € | 3.95 € |
| Average Labour Cost per Employee | 28.6% | 33,555 € | 34,539 € | 36,150 € | 29,628 € | 26,988 € | 28,307 € | 29,209 € | 35,250 € | 29,514 € | 26,092 € |
| Labour Share of Operating Cost | -13.0% | 36.02% | 37.42% | 37.98% | 40.05% | 35.96% | 33.93% | 35.04% | 37.33% | 41.31% | 41.42% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 59.7% | 10,547 | 11,823 | 11,908 | 9,844 | 9,628 | 8,456 | 8,533 | 8,806 | 6,707 | 6,605 |
| Total Revenue per Employee | 110.0% | 157,292 € | 176,784 € | 171,339 € | 121,403 € | 105,153 € | 100,028 € | 102,559 € | 104,005 € | 80,588 € | 74,910 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -42.0% | 22 | 16 | 17 | 21 | 56 | 44 | 32 | 37 | 34 | 37 |
| Total Asset Turnover (Total Revenue / Total Assets) | -23.7% | 0.321 | 0.244 | 0.246 | 0.262 | 0.611 | 0.516 | 0.389 | 0.434 | 0.412 | 0.420 |
| Annual Growth Total Asset Turnover | | 31.39% | -0.88% | -6.08% | -57.07% | 18.53% | 32.37% | -10.30% | 5.30% | -1.93% | base year |

## BFS – Belfast, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 31.5% | 14.91 € | 14.95 € | 14.39 € | 12.33 € | 10.92 € | 11.83 € | 12.02 € | 11.81 € | 12.01 € | 11.34 € |
| Inflation-Adjusted Total Revenue per WLU | 1.8% | 13.45 € | 13.70 € | 13.59 € | 12.04 € | 10.92 € | 12.21 € | 12.75 € | 12.74 € | 13.37 € | 13.22 € |
| Aeronautical Revenue per WLU | 16.2% | 10.21 € | 10.90 € | 10.21 € | 8.77 € | 7.99 € | 8.68 € | 8.97 € | 8.92 € | 9.17 € | 8.78 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -10.0% | 9.21 € | 9.99 € | 9.64 € | 8.56 € | 7.99 € | 8.96 € | 9.51 € | 9.63 € | 10.21 € | 10.24 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -7.81% | 3.62% | 12.63% | 7.14% | -10.84% | -5.77% | -1.19% | -5.69% | -0.31% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 45.9% | 346 € | 348 € | 310 € | 257 € | 231 € | 233 € | 243 € | 241 € | 236 € | 237 € |
| Aeronautical Revenue per Air Transport Movement | 15.0% | 589 € | 759 € | 717 € | 620 € | 494 € | 533 € | 569 € | 573 € | 521 € | 512 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 39.8% | 31.53% | 27.09% | 29.07% | 28.90% | 26.82% | 26.61% | 25.41% | 24.45% | 23.65% | 22.55% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 16.39% | -6.81% | 0.57% | 7.74% | 0.82% | 4.72% | 3.92% | 3.36% | 4.91% | base year |
| Commercial Revenue per Terminal Passenger | 83.5% | 5.33 € | 4.65 € | 4.85 € | 4.13 € | 3.44 € | 3.72 € | 3.54 € | 3.28 € | 3.26 € | 2.91 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 42.0% | 4.81 € | 4.26 € | 4.59 € | 4.04 € | 3.44 € | 3.84 € | 3.76 € | 3.54 € | 3.63 € | 3.39 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 46.1% | 1.681 | 1.609 | 1.726 | 1.512 | 1.141 | 1.069 | 1.179 | 1.122 | 1.113 | 1.151 |
| Annual Growth RevEx | | 4.49% | -6.76% | 14.15% | 32.51% | 6.75% | -9.37% | 5.07% | 0.82% | -3.26% | base year |
| Net Income per WLU | 306.7% | 6.04 € | 5.66 € | 6.05 € | 4.18 € | 1.35 € | 0.76 € | 1.83 € | 1.29 € | 1.22 € | 1.49 € |
| Return on Total Assets (ROA) | 136.0% | 13.00% | 9.24% | 10.36% | 8.88% | 7.55% | 3.32% | 5.92% | 4.73% | 4.19% | 5.51% |
| Operating Profit per WLU | 237.2% | 6.08 € | 7.15 € | 6.40 € | 4.82 € | 3.13 € | 1.96 € | 2.25 € | 1.09 € | 1.36 € | 1.80 € |
| Inflation-Adjusted Operating Profit per WLU | 160.9% | 5.48 € | 6.55 € | 6.04 € | 4.70 € | 3.13 € | 2.03 € | 2.39 € | 1.17 € | 1.52 € | 2.10 € |
| Return on Capital Employed (ROCE) | 95.7% | 13.08% | 11.67% | 10.95% | 10.25% | 17.49% | 8.56% | 7.29% | 4.00% | 4.68% | 6.69% |
| Annual Growth ROCE | | 12.08% | 6.58% | 6.86% | -41.40% | 104.31% | 17.46% | 82.36% | -14.55% | -30.04% | base year |

## BHX – Birmingham, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 1.2% | 14.37 € | 14.11 € | 15.17 € | 7.18 € | 10.38 € | 12.10 € | 14.11 € | 14.60 € | 15.81 € | 14.20 € |
| Inflation-Adjusted Total Cost per WLU | -21.7% | 12.96 € | 12.93 € | 14.33 € | 7.01 € | 10.38 € | 12.49 € | 14.97 € | 15.75 € | 17.59 € | 16.55 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 0.24% | -9.81% | 104.54% | -32.49% | -16.92% | -16.55% | -4.93% | -10.46% | 6.31% | base year |
| Operating Cost per WLU | 3.4% | 12.41 € | 11.84 € | 12.93 € | 10.52 € | 10.31 € | 11.87 € | 13.03 € | 13.67 € | 14.81 € | 12.00 € |
| Inflation-Adjusted Operating Cost per WLU | -19.9% | 11.20 € | 10.85 € | 12.21 € | 10.27 € | 10.31 € | 12.26 € | 13.82 € | 14.75 € | 16.48 € | 13.99 € |
| Depreciation Cost per WLU | -10.4% | 2.29 € | 1.97 € | 1.93 € | 1.39 € | 1.73 € | 1.92 € | 2.25 € | 2.40 € | 2.53 € | 2.56 € |
| Inflation-Adjusted Depreciation Cost per WLU | -30.7% | 2.07 € | 1.80 € | 1.83 € | 1.36 € | 1.73 € | 1.98 € | 2.39 € | 2.59 € | 2.82 € | 2.98 € |
| Depreciation Share of Operating Cost | -13.4% | 18.46% | 16.61% | 14.96% | 13.24% | 16.81% | 16.13% | 17.29% | 17.56% | 17.09% | 21.31% |
| Labour Cost per WLU | 7.3% | 4.09 € | 3.67 € | 4.55 € | 4.15 € | 3.70 € | 4.21 € | 4.32 € | 4.50 € | 4.71 € | 3.81 € |
| Average Labour Cost per Employee | 71.4% | 44,529 € | 40,672 € | 40,843 € | 33,331 € | 29,830 € | 31,528 € | 27,307 € | 25,278 € | 26,204 € | 25,972 € |
| Labour Share of Operating Cost | 3.7% | 32.95% | 31.03% | 35.18% | 39.47% | 35.84% | 35.48% | 33.19% | 32.91% | 31.80% | 31.76% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 59.8% | 10,885 | 11,072 | 8,981 | 8,029 | 8,072 | 7,486 | 6,315 | 5,619 | 5,565 | 6,812 |
| Total Revenue per Employee | 85.2% | 200,628 € | 197,805 € | 165,667 € | 114,611 € | 104,398 € | 106,353 € | 96,205 € | 89,225 € | 93,729 € | 108,337 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 3.4% | 20 | 25 | 26 | 35 | 32 | 29 | 25 | 22 | 20 | 20 |
| Total Asset Turnover (Total Revenue / Total Assets) | 19.9% | 0.376 | 0.453 | 0.474 | 0.493 | 0.416 | 0.407 | 0.384 | 0.353 | 0.329 | 0.314 |
| Annual Growth Total Asset Turnover | | -16.82% | -4.47% | -3.94% | 18.51% | 2.24% | 5.90% | 8.90% | 7.24% | 4.81% | base year |

## BHX – Birmingham, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 15.9% | 18.43 € | 17.86 € | 18.45 € | 14.27 € | 12.93 € | 14.21 € | 15.23 € | 15.88 € | 16.84 € | 15.90 € |
| Inflation-Adjusted Total Revenue per WLU | -10.3% | 16.63 € | 16.37 € | 17.43 € | 13.94 € | 12.93 € | 14.67 € | 16.16 € | 17.13 € | 18.74 € | 18.54 € |
| Aeronautical Revenue per WLU | 15.7% | 12.64 € | 11.25 € | 11.89 € | 8.66 € | 8.03 € | 9.12 € | 9.68 € | 10.25 € | 10.94 € | 10.92 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -10.4% | 11.40 € | 10.31 € | 11.24 € | 8.45 € | 8.03 € | 9.41 € | 10.27 € | 11.05 € | 12.17 € | 12.73 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 10.58% | -8.25% | 32.96% | 5.28% | -14.72% | -8.31% | -7.11% | -9.20% | -4.36% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 71.4% | 757 € | 707 € | 719 € | 507 € | 456 € | 486 € | 441 € | 408 € | 428 € | 442 € |
| Aeronautical Revenue per Air Transport Movement | 45.9% | 897 € | 853 € | 903 € | 632 € | 580 € | 639 € | 607 € | 571 € | 587 € | 615 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 0.3% | 31.43% | 37.03% | 35.53% | 39.36% | 37.93% | 35.81% | 36.47% | 35.48% | 35.05% | 31.33% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -15.12% | 4.23% | -9.75% | 3.77% | 5.91% | -1.81% | 2.81% | 1.21% | -11.87% | base year |
| Commercial Revenue per Terminal Passenger | 12.8% | 6.01 € | 6.87 € | 6.75 € | 5.83 € | 5.13 € | 5.30 € | 5.82 € | 5.88 € | 6.39 € | 5.32 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -12.7% | 5.42 € | 6.30 € | 6.38 € | 5.69 € | 5.13 € | 5.47 € | 6.17 € | 6.34 € | 7.11 € | 6.21 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 14.5% | 1.283 | 1.266 | 1.216 | 1.989 | 1.246 | 1.174 | 1.079 | 1.088 | 1.065 | 1.120 |
| Annual Growth RevEx | | 1.31% | 4.15% | -38.86% | 59.63% | 6.15% | 8.75% | -0.76% | 2.08% | -4.89% | base year |
| Net Income per WLU | 138.2% | 4.07 € | 3.76 € | 3.28 € | 7.10 € | 2.55 € | 2.10 € | 1.12 € | 1.28 € | 1.04 € | 1.71 € |
| Return on Total Assets (ROA) | 146.4% | 8.30% | 9.52% | 8.41% | 24.53% | 8.22% | 6.03% | 2.83% | 2.84% | 2.02% | 3.37% |
| Operating Profit per WLU | 54.3% | 6.02 € | 6.03 € | 5.52 € | 3.76 € | 2.62 € | 2.34 € | 2.21 € | 2.21 € | 2.03 € | 3.90 € |
| Inflation-Adjusted Operating Profit per WLU | 19.4% | 5.43 € | 5.53 € | 5.22 € | 3.67 € | 2.62 € | 2.41 € | 2.34 € | 2.38 € | 2.26 € | 4.55 € |
| Return on Capital Employed (ROCE) | 59.6% | 12.29% | 15.27% | 14.18% | 12.99% | 8.44% | 6.69% | 5.57% | 4.91% | 3.97% | 7.70% |
| Annual Growth ROCE | | -19.54% | 7.73% | 9.17% | 53.94% | 26.07% | 20.14% | 13.34% | 23.62% | -48.39% | base year |

## BRS – Bristol, UK

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -19.0% | 18.43 € | 16.52 € | 26.30 € | 19.34 € | 16.91 € | 17.48 € | 19.95 € | 21.14 € | 24.02 € | 22.75 € |
| Inflation-Adjusted Total Cost per WLU | -37.3% | 16.62 € | 15.14 € | 24.85 € | 18.88 € | 16.91 € | 18.04 € | 21.16 € | 22.81 € | 26.73 € | 26.51 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 9.76% | -39.06% | 31.61% | 11.67% | -6.29% | -14.73% | -7.23% | -14.66% | 0.82% | base year |
| Operating Cost per WLU | -25.4% | 16.20 € | 14.39 € | 28.60 € | 17.70 € | 15.37 € | 15.92 € | 18.28 € | 19.60 € | 22.94 € | 21.71 € |
| Inflation-Adjusted Operating Cost per WLU | -42.2% | 14.61 € | 13.19 € | 27.02 € | 17.28 € | 15.37 € | 16.43 € | 19.39 € | 21.14 € | 25.53 € | 25.30 € |
| Depreciation Cost per WLU | -38.8% | 1.21 € | 1.18 € | 1.18 € | 1.20 € | 1.21 € | 1.23 € | 1.34 € | 1.42 € | 2.05 € | 1.97 € |
| Inflation-Adjusted Depreciation Cost per WLU | -52.7% | 1.09 € | 1.08 € | 1.12 € | 1.17 € | 1.21 € | 1.27 € | 1.42 € | 1.53 € | 2.28 € | 2.30 € |
| Depreciation Share of Operating Cost | -18.0% | 7.44% | 8.17% | 4.13% | 6.77% | 7.88% | 7.73% | 7.32% | 7.24% | 8.92% | 9.08% |
| Labour Cost per WLU | -50.8% | 4.51 € | 5.22 € | 8.52 € | 8.28 € | 7.08 € | 7.84 € | 8.40 € | 8.49 € | 10.43 € | 9.17 € |
| Average Labour Cost per Employee | 50.0% | 49,772 € | 48,966 € | 47,447 € | 38,509 € | 33,345 € | 35,041 € | 34,713 € | 34,743 € | 35,136 € | 33,184 € |
| Labour Share of Operating Cost | -34.1% | 27.84% | 36.24% | 29.78% | 46.78% | 46.08% | 49.22% | 45.98% | 43.30% | 45.46% | 42.27% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 205.1% | 11,035 | 9,388 | 5,571 | 4,650 | 4,708 | 4,472 | 4,131 | 4,094 | 3,369 | 3,617 |
| Total Revenue per Employee | 193.6% | 260,795 € | 205,511 € | 121,209 € | 101,830 € | 91,520 € | 89,697 € | 91,767 € | 94,890 € | 83,421 € | 88,833 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -10.8% | 23 | 35 | 46 | 36 | 41 | 40 | 38 | 35 | 27 | 26 |
| Total Asset Turnover (Total Revenue / Total Assets) | -14.1% | 0.548 | 0.769 | 1.010 | 0.798 | 0.806 | 0.793 | 0.842 | 0.810 | 0.663 | 0.639 |
| Annual Growth Total Asset Turnover | | -28.67% | -23.91% | 26.64% | -1.04% | 1.68% | -5.87% | 3.94% | 22.22% | 3.83% | base year |

## BRS – Bristol, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -3.8% | 23.63 € | 21.89 € | 21.76 € | 21.90 € | 19.44 € | 20.06 € | 22.22 € | 23.18 € | 24.76 € | 24.56 € |
| Inflation-Adjusted Total Revenue per WLU | -25.5% | 21.32 € | 20.06 € | 20.56 € | 21.38 € | 19.44 € | 20.70 € | 23.57 € | 25.00 € | 27.55 € | 28.63 € |
| Aeronautical Revenue per WLU | -8.5% | 12.50 € | 11.22 € | 10.97 € | 11.43 € | 10.47 € | 11.31 € | 12.36 € | 12.57 € | 13.22 € | 13.67 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -29.2% | 11.28 € | 10.28 € | 10.37 € | 11.16 € | 10.47 € | 11.67 € | 13.11 € | 13.56 € | 14.72 € | 15.93 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 9.67% | -0.85% | -7.08% | 6.62% | -10.34% | -10.94% | -3.36% | -7.83% | -7.63% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 164.1% | 416 € | 350 € | 318 € | 315 € | 304 € | 312 € | 289 € | 264 € | 174 € | 158 € |
| Aeronautical Revenue per Air Transport Movement | 44.0% | 813 € | 629 € | 597 € | 607 € | 571 € | 587 € | 601 € | 550 € | 475 € | 564 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 6.2% | 47.11% | 48.75% | 49.56% | 47.81% | 46.15% | 43.62% | 44.38% | 45.75% | 46.60% | 44.35% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -3.37% | -1.63% | 3.66% | 3.59% | 5.82% | -1.73% | -2.99% | -1.82% | 5.06% | base year |
| Commercial Revenue per Terminal Passenger | 2.6% | 11.61 € | 11.15 € | 11.26 € | 10.99 € | 9.41 € | 9.26 € | 10.56 € | 11.07 € | 12.06 € | 11.31 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -20.6% | 10.47 € | 10.22 € | 10.64 € | 10.73 € | 9.41 € | 9.56 € | 11.20 € | 11.94 € | 13.42 € | 13.19 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 18.8% | 1.283 | 1.325 | 0.827 | 1.132 | 1.150 | 1.148 | 1.114 | 1.096 | 1.031 | 1.080 |
| Annual Growth RevEx | | -3.18% | 60.14% | -26.95% | -1.49% | 0.18% | 3.02% | 1.62% | 6.32% | -4.52% | base year |
| Net Income per WLU | 186.9% | 5.21 € | 5.37 € | -4.54 € | 2.56 € | 2.53 € | 2.58 € | 2.27 € | 2.03 € | 0.74 € | 1.82 € |
| Return on Total Assets (ROA) | 156.0% | 12.08% | 18.85% | -21.09% | 9.33% | 10.49% | 10.19% | 8.61% | 7.10% | 1.99% | 4.72% |
| Operating Profit per WLU | 160.4% | 7.43 € | 7.50 € | -6.84 € | 4.20 € | 4.07 € | 4.14 € | 3.94 € | 3.58 € | 1.82 € | 2.85 € |
| Inflation-Adjusted Operating Profit per WLU | 101.5% | 6.71 € | 6.87 € | -6.46 € | 4.10 € | 4.07 € | 4.27 € | 4.18 € | 3.86 € | 2.02 € | 3.33 € |
| Return on Capital Employed (ROCE) | 132.4% | 17.24% | 26.34% | -31.75% | 15.29% | 16.87% | 16.35% | 14.93% | 12.52% | 4.87% | 7.42% |
| Annual Growth ROCE | | -34.52% | 182.94% | -307.66% | -9.35% | 3.18% | 9.47% | 19.33% | 157.14% | -34.42% | base year |

## BRU – Brussels, Belgium

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-97 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 43.1% | n/a | n/a | 6.06 € | 6.54 € | 7.20 € | 6.27 € | 5.64 € | 4.99 € | 4.52 € | 4.23 € |
| Inflation-Adjusted Total Cost per WLU | 22.3% | n/a | n/a | 5.84 € | 6.41 € | 7.20 € | 6.36 € | 5.86 € | 5.33 € | 4.94 € | 4.78 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | n/a | n/a | -8.84% | -10.96% | 13.18% | 8.54% | 10.00% | 7.82% | 3.39% | base year |
| Operating Cost per WLU | 7.8% | n/a | n/a | 4.54 € | 5.28 € | 5.69 € | 5.08 € | 4.94 € | 4.76 € | 4.48 € | 4.21 € |
| Inflation-Adjusted Operating Cost per WLU | -7.9% | n/a | n/a | 4.37 € | 5.17 € | 5.69 € | 5.15 € | 5.13 € | 5.08 € | 4.90 € | 4.75 € |
| Depreciation Cost per WLU | -36.5% | n/a | n/a | 1.19 € | 1.47 € | 1.61 € | 1.55 € | 1.61 € | 1.30 € | 1.54 € | 1.88 € |
| Inflation-Adjusted Depreciation Cost per WLU | -45.7% | n/a | n/a | 1.15 € | 1.44 € | 1.61 € | 1.57 € | 1.67 € | 1.39 € | 1.68 € | 2.12 € |
| Depreciation Share of Operating Cost | -41.0% | n/a | n/a | 26.30% | 27.79% | 28.27% | 30.50% | 32.66% | 27.37% | 34.27% | 44.60% |
| Labour Cost per WLU | 360.1% | n/a | n/a | 0.38 € | 0.42 € | 0.42 € | 0.33 € | 0.23 € | 0.21 € | 0.13 € | 0.08 € |
| Average Labour Cost per Employee | -6.5% | n/a | n/a | 98,161 € | 87,881 € | 89,137 € | 97,149 € | 90,190 € | 111,952 € | 111,334 € | 104,995 € |
| Labour Share of Operating Cost | 326.9% | n/a | n/a | 8.30% | 7.95% | 7.41% | 6.43% | 4.69% | 4.31% | 2.80% | 1.94% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | -79.7% | n/a | n/a | 260,780 | 209,307 | 211,458 | 297,821 | 389,296 | 545,771 | 886,251 | 1,283,333 |
| Total Revenue per Employee | -69.8% | n/a | n/a | 1,847,186€ | 1,560,853€ | 1,602,014€ | 1,987,674€ | 2,345,710€ | 2,991,719€ | 4,522,038€ | 6,117,469€ |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -54.7% | n/a | n/a | 54 | 44 | 37 | 38 | 42 | 60 | 84 | 120 |
| Total Asset Turnover (Total Revenue / Total Assets) | -32.6% | n/a | n/a | 0.386 | 0.327 | 0.281 | 0.251 | 0.256 | 0.327 | 0.428 | 0.572 |
| Annual Growth Total Asset Turnover | | n/a | n/a | 17.78% | 16.70% | 11.85% | -1.88% | -21.85% | -23.48% | -25.30% | base year |

## BRU – Brussels, Belgium

## Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-97 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 48.6% | n/a | n/a | 7.08 € | 7.46 € | 7.58 € | 6.67 € | 6.03 € | 5.48 € | 5.10 € | 4.77 € |
| Inflation-Adjusted Total Revenue per WLU | 27.0% | n/a | n/a | 6.83 € | 7.30 € | 7.58 € | 6.77 € | 6.26 € | 5.85 € | 5.58 € | 5.38 € |
| Aeronautical Revenue per WLU | 81.9% | n/a | n/a | 3.83 € | 3.71 € | 3.52 € | 3.74 € | 2.63 € | 2.32 € | 2.11 € | 2.11 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 55.4% | n/a | n/a | 3.70 € | 3.63 € | 3.52 € | 3.79 € | 2.73 € | 2.47 € | 2.31 € | 2.38 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | n/a | n/a | 1.80% | 3.25% | -7.30% | 38.76% | 10.63% | 7.12% | -2.98% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 131.7% | n/a | n/a | 292 € | 252 € | 243 € | 252 € | 165 € | 142 € | 120 € | 126 € |
| Aeronautical Revenue per Air Transport Movement | 125.6% | n/a | n/a | 318 € | 276 € | 268 € | 280 € | 185 € | 160 € | 139 € | 141 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -17.8% | n/a | n/a | 45.90% | 50.30% | 53.59% | 43.97% | 56.32% | 57.77% | 58.64% | 55.81% |
| Annual Growth Non-Aeron. Share of Total Revenue | | n/a | n/a | -8.74% | -6.15% | 21.89% | -21.93% | -2.51% | -1.49% | 5.06% | base year |
| Commercial Revenue per Terminal Passenger | 7.2% | n/a | n/a | 3.95 € | 4.99 € | 4.76 € | 3.46 € | 3.61 € | 3.66 € | 3.67 € | 3.69 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -8.4% | n/a | n/a | 3.81 € | 4.89 € | 4.76 € | 3.51 € | 3.75 € | 3.91 € | 4.01 € | 4.16 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 3.8% | n/a | n/a | 1.169 | 1.140 | 1.052 | 1.064 | 1.068 | 1.098 | 1.129 | 1.126 |
| Annual Growth RevEx | | n/a | n/a | 2.59% | 8.28% | -1.11% | -0.33% | -2.77% | -2.70% | 0.25% | base year |
| Net Income per WLU | 92.3% | n/a | n/a | 1.02 € | 0.91 € | 0.38 € | 0.40 € | 0.38 € | 0.49 € | 0.58 € | 0.53 € |
| Return on Total Assets (ROA) | -12.8% | n/a | n/a | 5.58% | 4.01% | 1.40% | 1.51% | 1.62% | 2.92% | 4.87% | 6.40% |
| Operating Profit per WLU | 356.6% | n/a | n/a | 2.55 € | 2.18 € | 1.88 € | 1.60 € | 1.09 € | 0.72 € | 0.62 € | 0.56 € |
| Inflation-Adjusted Operating Profit per WLU | 290.1% | n/a | n/a | 2.46 € | 2.13 € | 1.88 € | 1.62 € | 1.13 € | 0.77 € | 0.68 € | 0.63 € |
| Return on Capital Employed (ROCE) | 107.0% | n/a | n/a | 13.87% | 9.57% | 6.98% | 6.00% | 4.62% | 4.29% | 5.22% | 6.70% |
| Annual Growth ROCE | | n/a | n/a | 44.97% | 37.08% | 16.26% | 29.83% | 7.68% | -17.72% | -22.11% | base year |

## BSL – Basel Mulhouse, Switzerland (France)

## Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 27.0% | 13.86 € | 13.22 € | 13.70 € | 13.85 € | 14.97 € | 15.60 € | 14.33 € | 11.83 € | 12.72 € | 10.92 € |
| Inflation-Adjusted Total Cost per WLU | 8.8% | 13.25 € | 12.71 € | 13.28 € | 13.58 € | 14.97 € | 15.87 € | 14.84 € | 12.49 € | 13.76 € | 12.18 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 4.23% | -4.26% | -2.20% | -9.28% | -5.67% | 6.96% | 18.73% | -9.17% | 12.91% | base year |
| Operating Cost per WLU | 30.8% | 13.00 € | 12.21 € | 13.11 € | 12.93 € | 12.41 € | 12.53 € | 12.29 € | 11.33 € | 11.52 € | 9.93 € |
| Inflation-Adjusted Operating Cost per WLU | 12.1% | 12.43 € | 11.74 € | 12.71 € | 12.68 € | 12.41 € | 12.74 € | 12.72 € | 11.97 € | 12.45 € | 11.09 € |
| Depreciation Cost per WLU | 73.6% | 6.00 € | 5.10 € | 5.16 € | 4.84 € | 4.51 € | 4.69 € | 4.84 € | 4.48 € | 4.42 € | 3.46 € |
| Inflation-Adjusted Depreciation Cost per WLU | 48.7% | 5.74 € | 4.91 € | 5.00 € | 4.75 € | 4.51 € | 4.77 € | 5.01 € | 4.73 € | 4.78 € | 3.86 € |
| Depreciation Share of Operating Cost | 32.7% | 46.15% | 41.80% | 39.32% | 37.47% | 36.35% | 37.43% | 39.39% | 39.56% | 38.41% | 34.79% |
| Labour Cost per WLU | 0.9% | 2.89 € | 3.06 € | 3.43 € | 3.51 € | 3.52 € | 3.78 € | 3.57 € | 3.26 € | 3.36 € | 2.86 € |
| Average Labour Cost per Employee | 46.1% | 48,915 € | 46,742 € | 45,760 € | 46,274 € | 45,479 € | 43,829 € | 40,220 € | 37,802 € | 36,894 € | 33,479 € |
| Labour Share of Operating Cost | -22.9% | 22.23% | 25.10% | 26.16% | 27.17% | 28.37% | 30.19% | 29.08% | 28.77% | 29.21% | 28.84% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 44.8% | 16,926 | 15,253 | 13,340 | 13,169 | 12,912 | 11,588 | 11,255 | 11,594 | 10,965 | 11,686 |
| Total Revenue per Employee | 84.4% | 235,287 € | 202,811 € | 194,330 € | 187,990 € | 184,465 € | 165,601 € | 153,251 € | 147,019 € | 139,548 € | 127,595 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 59.7% | 21 | 21 | 15 | 14 | 14 | 13 | 13 | 14 | 12 | 13 |
| Total Asset Turnover (Total Revenue / Total Assets) | 103.3% | 0.293 | 0.285 | 0.218 | 0.198 | 0.193 | 0.185 | 0.179 | 0.174 | 0.157 | 0.144 |
| Annual Growth Total Asset Turnover | | 2.91% | 30.43% | 10.54% | 2.17% | 4.81% | 3.23% | 2.94% | 10.64% | 8.85% | base year |

## BSL – Basel Mulhouse, Switzerland (France)

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 27.3% | 13.90 € | 13.30 € | 14.57 € | 14.27 € | 14.29 € | 14.29 € | 13.62 € | 12.68 € | 12.73 € | 10.92 € |
| Inflation-Adjusted Total Revenue per WLU | 9.1% | 13.29 € | 12.79 € | 14.12 € | 13.99 € | 14.29 € | 14.54 € | 14.10 € | 13.39 € | 13.76 € | 12.19 € |
| Aeronautical Revenue per WLU | 39.7% | 6.38 € | 5.64 € | 6.18 € | 6.02 € | 5.77 € | 5.60 € | 5.43 € | 5.18 € | 5.07 € | 4.56 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 19.7% | 6.10 € | 5.42 € | 5.99 € | 5.90 € | 5.77 € | 5.70 € | 5.62 € | 5.47 € | 5.48 € | 5.09 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 12.42% | -9.46% | 1.46% | 2.23% | 1.29% | 1.37% | 2.74% | -0.18% | 7.65% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 137.2% | 218 € | 179 € | 170 € | 160 € | 145 € | 132 € | 133 € | 118 € | 114 € | 92 € |
| Aeronautical Revenue per Air Transport Movement | 49.8% | 279 € | 257 € | 267 € | 263 € | 266 € | 252 € | 255 € | 237 € | 212 € | 186 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -7.0% | 54.13% | 57.59% | 57.57% | 57.82% | 59.58% | 60.79% | 60.10% | 59.12% | 60.15% | 58.20% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -6.01% | 0.03% | -0.43% | -2.95% | -1.98% | 1.14% | 1.66% | -1.70% | 3.34% | base year |
| Commercial Revenue per Terminal Passenger | 30.4% | 8.33 € | 9.31 € | 8.35 € | 8.88 € | 8.81 € | 8.61 € | 8.16 € | 7.58 € | 7.62 € | 6.39 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 11.7% | 7.97 € | 8.95 € | 8.09 € | 8.71 € | 8.81 € | 8.76 € | 8.45 € | 8.00 € | 8.24 € | 7.13 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 0.3% | 1.003 | 1.006 | 1.063 | 1.031 | 0.954 | 0.916 | 0.950 | 1.072 | 1.000 | 1.000 |
| Annual Growth RevEx | | -0.27% | -5.39% | 3.14% | 7.98% | 4.18% | -3.57% | -11.35% | 7.16% | -0.01% | base year |
| Net Income per WLU | 1378.7% | 0.04 € | 0.07 € | 0.86 € | 0.42 € | -0.68 € | -1.31 € | -0.71 € | 0.85 € | 0.00 € | 0.00 € |
| Return on Total Assets (ROA) | 2261.4% | 0.09% | 0.16% | 1.29% | 0.59% | -0.92% | -1.69% | -0.94% | 1.16% | 0.00% | 0.00% |
| Operating Profit per WLU | -8.3% | 0.90 € | 1.09 € | 1.46 € | 1.34 € | 1.87 € | 1.76 € | 1.33 € | 1.35 € | 1.21 € | 0.98 € |
| Inflation-Adjusted Operating Profit per WLU | -21.5% | 0.86 € | 1.05 € | 1.41 € | 1.32 € | 1.87 € | 1.79 € | 1.37 € | 1.42 € | 1.30 € | 1.10 € |
| Return on Capital Employed (ROCE) | 46.4% | 1.90% | 2.33% | 2.18% | 1.86% | 2.53% | 2.28% | 1.74% | 1.84% | 1.49% | 1.30% |
| Annual Growth ROCE | | -18.31% | 6.76% | 17.32% | -26.56% | 11.18% | 30.74% | -5.53% | 23.96% | 14.49% | base year |

## CGN – Cologne, Germany

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 14.6% | 17.43 € | 18.87 € | 14.92 € | 21.49 € | 19.61 € | 19.34 € | 18.97 € | 18.78 € | 17.04 € | 15.20 € |
| Inflation-Adjusted Total Cost per WLU | -8.4% | 16.61 € | 18.10 € | 14.45 € | 21.20 € | 19.61 € | 19.67 € | 19.82 € | 20.50 € | 19.54 € | 18.14 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -8.19% | 25.26% | -31.85% | 8.12% | -0.34% | -0.77% | -3.31% | 4.92% | 7.72% | base year |
| Operating Cost per WLU | 13.8% | 16.63 € | 18.00 € | 14.85 € | 15.14 € | 19.55 € | 19.25 € | 18.93 € | 18.37 € | 16.44 € | 14.62 € |
| Inflation-Adjusted Operating Cost per WLU | -9.1% | 15.85 € | 17.26 € | 14.38 € | 14.93 € | 19.55 € | 19.58 € | 19.79 € | 20.06 € | 18.86 € | 17.45 € |
| Depreciation Cost per WLU | 3.4% | 3.00 € | 3.47 € | 2.95 € | 3.02 € | 3.04 € | 4.36 € | 3.56 € | 2.86 € | 3.21 € | 2.90 € |
| Inflation-Adjusted Depreciation Cost per WLU | -17.4% | 2.86 € | 3.32 € | 2.86 € | 2.97 € | 3.04 € | 4.43 € | 3.72 € | 3.12 € | 3.68 € | 3.47 € |
| Depreciation Share of Operating Cost | -9.1% | 18.06% | 19.27% | 19.88% | 19.92% | 15.54% | 22.64% | 18.81% | 15.54% | 19.52% | 19.86% |
| Labour Cost per WLU | -5.6% | 6.35 € | 6.62 € | 6.42 € | 6.97 € | 7.02 € | 7.47 € | 7.97 € | 7.64 € | 7.20 € | 6.73 € |
| Average Labour Cost per Employee | 52.7% | 44,629 € | 41,845 € | 40,521 € | 41,623 € | 39,338 € | 37,384 € | 37,230 € | 34,113 € | 31,896 € | 29,234 € |
| Labour Share of Operating Cost | -17.0% | 38.20% | 36.77% | 43.19% | 46.05% | 35.92% | 38.83% | 42.08% | 41.57% | 43.77% | 46.03% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 61.7% | 7,025 | 6,322 | 6,315 | 5,969 | 5,604 | 5,002 | 4,673 | 4,467 | 4,432 | 4,344 |
| Total Revenue per Employee | 88.8% | 124,725 € | 113,477 € | 109,788 € | 111,620 € | 109,861 € | 96,731 € | 88,661 € | 83,897 € | 75,528 € | 66,045 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -27.7% | 24 | 26 | 40 | 40 | 39 | 34 | 31 | 32 | 35 | 34 |
| Total Asset Turnover (Total Revenue / Total Assets) | -15.6% | 0.433 | 0.461 | 0.689 | 0.756 | 0.755 | 0.652 | 0.591 | 0.600 | 0.596 | 0.513 |
| Annual Growth Total Asset Turnover | | -6.03% | -33.08% | -8.91% | 0.10% | 15.82% | 10.27% | -1.53% | 0.77% | 16.16% | base year |

## CGN – Cologne, Germany

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 16.8% | 17.75 € | 17.95 € | 17.38 € | 18.70 € | 19.61 € | 19.34 € | 18.97 € | 18.78 € | 17.04 € | 15.20 € |
| Inflation-Adjusted Total Revenue per WLU | -6.7% | 16.92 € | 17.21 € | 16.83 € | 18.44 € | 19.61 € | 19.67 € | 19.82 € | 20.50 € | 19.54 € | 18.14 € |
| Aeronautical Revenue per WLU | 18.7% | 12.95 € | 12.65 € | 13.40 € | 13.69 € | 14.67 € | 14.17 € | 14.10 € | 14.04 € | 12.25 € | 10.91 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -5.1% | 12.35 € | 12.13 € | 12.97 € | 13.50 € | 14.67 € | 14.41 € | 14.73 € | 15.32 € | 14.05 € | 13.02 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 1.79% | -6.46% | -3.95% | -7.97% | 1.81% | -2.18% | -3.86% | 9.03% | 7.94% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 91.8% | 866 € | 811 € | 839 € | 854 € | 863 € | 780 € | 722 € | 660 € | 549 € | 452 € |
| Aeronautical Revenue per Air Transport Movement | 82.7% | 988 € | 944 € | 974 € | 990 € | 1,034 € | 961 € | 874 € | 796 € | 642 € | 541 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -4.3% | 27.03% | 29.51% | 22.93% | 26.79% | 25.17% | 26.75% | 25.69% | 25.27% | 28.09% | 28.23% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -8.38% | 28.65% | -14.38% | 6.42% | -5.90% | 4.10% | 1.70% | -10.04% | -0.52% | base year |
| Commercial Revenue per Terminal Passenger | 11.9% | 7.17 € | 7.03 € | 6.74 € | 7.08 € | 7.15 € | 7.63 € | 7.10 € | 7.01 € | 7.20 € | 6.41 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -10.6% | 6.83 € | 6.74 € | 6.52 € | 6.99 € | 7.15 € | 7.76 € | 7.42 € | 7.65 € | 8.26 € | 7.64 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 1.9% | 1.019 | 0.951 | 1.165 | 0.870 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Annual Growth RevEx | | 7.12% | -18.36% | 33.90% | -13.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | base year |
| Net Income per WLU | 111.7% | 0.33 € | -0.92 € | 2.46 € | -2.79 € | 0.00 € | 0.00 € | 0.00 € | 0.00 € | 0.00 € | 0.00 € |
| Return on Total Assets (ROA) | 107.0% | 0.80% | -2.37% | 9.75% | -11.30% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Operating Profit per WLU | 92.8% | 1.12 € | -0.05 € | 2.53 € | 3.56 € | 0.06 € | 0.09 € | 0.04 € | 0.41 € | 0.60 € | 0.58 € |
| Inflation-Adjusted Operating Profit per WLU | 54.0% | 1.07 € | -0.05 € | 2.45 € | 3.51 € | 0.06 € | 0.09 € | 0.04 € | 0.45 € | 0.69 € | 0.70 € |
| Return on Capital Employed (ROCE) | 39.3% | 2.74% | -0.13% | 10.02% | 14.38% | 0.23% | 0.30% | 0.12% | 1.31% | 2.09% | 1.97% |
| Annual Growth ROCE | | 2280.78% | -101.25% | -30.35% | 6220.80% | -23.97% | 155.22% | -91.03% | -37.47% | 6.32% | base year |

## CPH – Copenhagen, Denmark

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 9.3% | 9.14 € | 8.61 € | 8.10 € | 8.56 € | 7.85 € | 7.32 € | 7.40 € | 8.75 € | 8.44 € | 8.36 € |
| Inflation-Adjusted Total Cost per WLU | -8.9% | 8.40 € | 8.10 € | 7.76 € | 8.39 € | 7.85 € | 7.47 € | 7.71 € | 9.22 € | 9.09 € | 9.22 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 3.68% | 4.40% | -7.52% | 6.79% | 5.14% | -3.15% | -16.35% | 1.47% | -1.43% | base year |
| Operating Cost per WLU | 12.3% | 7.40 € | 7.00 € | 6.51 € | 7.03 € | 6.19 € | 5.86 € | 6.11 € | 7.25 € | 6.92 € | 6.59 € |
| Inflation-Adjusted Operating Cost per WLU | -6.5% | 6.80 € | 6.59 € | 6.23 € | 6.88 € | 6.19 € | 5.98 € | 6.36 € | 7.64 € | 7.45 € | 7.27 € |
| Depreciation Cost per WLU | 77.2% | 2.33 € | 2.07 € | 1.91 € | 2.00 € | 1.67 € | 1.41 € | 1.47 € | 1.58 € | 1.27 € | 1.32 € |
| Inflation-Adjusted Depreciation Cost per WLU | 47.6% | 2.14 € | 1.95 € | 1.83 € | 1.96 € | 1.67 € | 1.44 € | 1.53 € | 1.66 € | 1.36 € | 1.45 € |
| Depreciation Share of Operating Cost | 57.8% | 31.52% | 29.54% | 29.41% | 28.44% | 27.02% | 24.07% | 24.11% | 21.73% | 18.29% | 19.97% |
| Labour Cost per WLU | 3.1% | 3.08 € | 3.03 € | 2.65 € | 2.86 € | 2.67 € | 2.72 € | 2.87 € | 2.94 € | 3.02 € | 2.99 € |
| Average Labour Cost per Employee | 37.8% | 43,686 € | 43,111 € | 38,863 € | 39,652 € | 37,333 € | 36,677 € | 35,299 € | 31,525 € | 30,586 € | 31,692 € |
| Labour Share of Operating Cost | -8.1% | 41.68% | 43.23% | 40.78% | 40.66% | 43.19% | 46.37% | 47.00% | 40.54% | 43.57% | 45.36% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 33.6% | 14,164 | 14,243 | 14,642 | 13,873 | 13,960 | 13,492 | 12,291 | 10,721 | 10,137 | 10,598 |
| Total Revenue per Employee | 76.9% | 163,979 € | 160,189 € | 150,276 € | 147,736 € | 137,513 € | 119,074 € | 106,250 € | 107,493 € | 93,567 € | 92,701 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -50.9% | 24 | 25 | 33 | 36 | 42 | 42 | 45 | 42 | 42 | 50 |
| Total Asset Turnover (Total Revenue / Total Assets) | -35.0% | 0.282 | 0.286 | 0.340 | 0.383 | 0.413 | 0.370 | 0.393 | 0.417 | 0.388 | 0.435 |
| Annual Growth Total Asset Turnover | | -1.16% | -16.02% | -11.10% | -7.30% | 11.63% | -5.82% | -5.75% | 7.34% | -10.67% | base year |

## CPH – Copenhagen, Denmark

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 32.4% | 11.58 € | 11.25 € | 10.26 € | 10.65 € | 9.85 € | 8.83 € | 8.64 € | 10.03 € | 9.23 € | 8.75 € |
| Inflation-Adjusted Total Revenue per WLU | 10.2% | 10.63 € | 10.58 € | 9.83 € | 10.43 € | 9.85 € | 9.01 € | 9.00 € | 10.57 € | 9.94 € | 9.64 € |
| Aeronautical Revenue per WLU | 8.9% | 6.15 € | 5.21 € | 5.07 € | 5.32 € | 5.34 € | 5.24 € | 5.08 € | 6.27 € | 5.61 € | 5.65 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -9.3% | 5.65 € | 4.90 € | 4.86 € | 5.21 € | 5.34 € | 5.35 € | 5.29 € | 6.61 € | 6.04 € | 6.23 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 15.31% | 0.84% | -6.73% | -2.58% | -0.02% | 1.05% | -19.97% | 9.40% | -2.95% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 23.3% | 320 € | 270 € | 260 € | 265 € | 273 € | 260 € | 244 € | 282 € | 249 € | 259 € |
| Aeronautical Revenue per Air Transport Movement | 5.8% | 428 € | 369 € | 360 € | 365 € | 381 € | 369 € | 346 € | 415 € | 388 € | 405 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 32.3% | 46.89% | 53.71% | 50.60% | 50.08% | 45.74% | 40.64% | 41.25% | 37.44% | 39.19% | 35.44% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -12.71% | 6.15% | 1.04% | 9.47% | 12.56% | -1.48% | 10.19% | -4.47% | 10.56% | base year |
| Commercial Revenue per Terminal Passenger | 75.8% | 6.15 € | 6.73 € | 5.90 € | 5.93 € | 5.10 € | 3.91 € | 3.90 € | 4.01 € | 4.02 € | 3.50 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 46.4% | 5.65 € | 6.33 € | 5.65 € | 5.80 € | 5.10 € | 3.99 € | 4.07 € | 4.23 € | 4.33 € | 3.86 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 21.0% | 1.266 | 1.306 | 1.267 | 1.244 | 1.254 | 1.206 | 1.167 | 1.146 | 1.093 | 1.046 |
| Annual Growth RevEx | | -3.08% | 3.08% | 1.92% | -0.85% | 4.04% | 3.27% | 1.88% | 4.80% | 4.53% | base year |
| Net Income per WLU | 531.9% | 2.43 € | 2.64 € | 2.17 € | 2.09 € | 2.00 € | 1.51 € | 1.24 € | 1.28 € | 0.79 € | 0.39 € |
| Return on Total Assets (ROA) | 210.3% | 5.94% | 6.70% | 7.18% | 7.50% | 8.37% | 6.31% | 5.63% | 5.30% | 3.32% | 1.91% |
| Operating Profit per WLU | 93.8% | 4.18 € | 4.24 € | 3.75 € | 3.62 € | 3.66 € | 2.96 € | 2.53 € | 2.77 € | 2.31 € | 2.15 € |
| Inflation-Adjusted Operating Profit per WLU | 61.4% | 3.84 € | 3.99 € | 3.60 € | 3.55 € | 3.66 € | 3.02 € | 2.64 € | 2.92 € | 2.48 € | 2.38 € |
| Return on Capital Employed (ROCE) | -4.8% | 10.19% | 10.78% | 12.45% | 13.01% | 15.33% | 12.42% | 11.51% | 11.52% | 9.70% | 10.71% |
| Annual Growth ROCE | | -5.53% | -13.36% | -4.34% | -15.13% | 23.46% | 7.87% | -0.09% | 18.83 | -9.42% | base year |

## CWL – Cardiff, UK

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -17.5% | 13.25 € | 11.60 € | 12.79 € | 11.17 € | 9.79 € | 13.64 € | 14.79 € | 14.50 € | 16.86 € | 16.06 € |
| Inflation-Adjusted Total Cost per WLU | -36.1% | 11.96 € | 10.63 € | 12.09 € | 10.91 € | 9.79 € | 14.08 € | 15.69 € | 15.64 € | 18.76 € | 18.71 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 12.43% | -12.03% | 10.79% | 11.44% | -30.48% | -10.24% | 0.29% | -16.60% | 0.23% | base year |
| Operating Cost per WLU | -8.8% | 13.22 € | 11.42 € | 12.09 € | 10.99 € | 9.71 € | 12.10 € | 13.86 € | 14.21 € | 17.28 € | 14.49 € |
| Inflation-Adjusted Operating Cost per WLU | -29.4% | 11.93 € | 10.47 € | 11.43 € | 10.73 € | 9.71 € | 12.49 € | 14.70 € | 15.33 € | 19.23 € | 16.89 € |
| Depreciation Cost per WLU | -40.8% | 1.10 € | 0.98 € | 0.99 € | 1.04 € | 1.55 € | 1.84 € | 1.46 € | 1.71 € | 2.13 € | 1.87 € |
| Inflation-Adjusted Depreciation Cost per WLU | -54.2% | 1.00 € | 0.90 € | 0.94 € | 1.01 € | 1.55 € | 1.89 € | 1.55 € | 1.85 € | 2.37 € | 2.18 € |
| Depreciation Share of Operating Cost | -35.1% | 8.36% | 8.58% | 8.19% | 9.45% | 16.00% | 15.17% | 10.53% | 12.04% | 12.31% | 12.88% |
| Labour Cost per WLU | -45.4% | 2.71 € | 3.64 € | 3.79 € | 3.48 € | 3.41 € | 3.90 € | 4.60 € | 5.06 € | 5.95 € | 4.96 € |
| Average Labour Cost per Employee | 35.2% | 36,236 € | 30,399 € | 29,176 € | 26,431 € | 26,812 € | 30,121 € | 29,704 € | 27,501 € | 28,243 € | 26,802 € |
| Labour Share of Operating Cost | -40.1% | 20.47% | 31.89% | 31.30% | 31.64% | 35.10% | 32.22% | 33.15% | 35.58% | 34.41% | 34.20% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 147.6% | 13,389 | 8,343 | 7,707 | 7,600 | 7,864 | 7,728 | 6,464 | 5,439 | 4,749 | 5,407 |
| Total Revenue per Employee | 215.3% | 293,207 € | 165,365 € | 153,986 € | 130,011 € | 125,507 € | 124,311 € | 114,549 € | 88,743 € | 83,256 € | 92,983 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 26.0% | 15 | 12 | 12 | 14 | 17 | 15 | 17 | 13 | 11 | 12 |
| Total Asset Turnover (Total Revenue / Total Assets) | 60.4% | 0.319 | 0.230 | 0.233 | 0.247 | 0.278 | 0.248 | 0.294 | 0.217 | 0.192 | 0.199 |
| Annual Growth Total Asset Turnover | | 38.59% | -1.01% | -5.89% | -11.17% | 12.47% | -15.76% | 35.67% | 12.82% | -3.52% | base year |

## CWL – Cardiff, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 27.3% | 21.90 € | 19.82 € | 19.98 € | 17.11 € | 15.96 € | 16.09 € | 17.72 € | 16.32 € | 17.53 € | 17.20 € |
| Inflation-Adjusted Total Revenue per WLU | -1.4% | 19.76 € | 18.17 € | 18.88 € | 16.70 € | 15.96 € | 16.60 € | 18.80 € | 17.60 € | 19.51 € | 20.04 € |
| Aeronautical Revenue per WLU | 35.0% | 16.41 € | 13.60 € | 13.73 € | 11.41 € | 10.96 € | 11.33 € | 11.15 € | 10.82 € | 11.24 € | 12.16 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 4.4% | 14.81 € | 12.46 € | 12.97 € | 11.14 € | 10.96 € | 11.70 € | 11.83 € | 11.67 € | 12.51 € | 14.18 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 18.82% | -3.95% | 16.46% | 1.66% | -6.35% | -1.08% | 1.36% | -6.72% | -11.74% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 194.6% | 348 € | 267 € | 264 € | 204 € | 221 € | 211 € | 165 € | 139 € | 118 € | 118 € |
| Aeronautical Revenue per Air Transport Movement | 79.1% | 1,225 € | 964 € | 946 € | 709 € | 773 € | 738 € | 626 € | 505 € | 473 € | 684 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -14.4% | 25.05% | 31.40% | 31.28% | 33.31% | 31.33% | 29.53% | 37.07% | 33.70% | 35.86% | 29.28% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -20.23% | 0.40% | -6.10% | 6.31% | 6.10% | -20.34% | 10.01% | -6.03% | 22.49% | base year |
| Commercial Revenue per Terminal Passenger | 5.1% | 5.62 € | 6.36 € | 6.42 € | 5.86 € | 5.15 € | 4.87 € | 6.70 € | 5.62 € | 6.46 € | 5.34 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -18.6% | 5.07 € | 5.83 € | 6.07 € | 5.72 € | 5.15 € | 5.03 € | 7.11 € | 6.07 € | 7.19 € | 6.23 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 54.3% | 1.652 | 1.708 | 1.562 | 1.531 | 1.630 | 1.179 | 1.198 | 1.125 | 1.040 | 1.071 |
| Annual Growth RevEx | | -3.27% | 9.38% | 2.01% | -6.07% | 38.24% | -1.59% | 6.49% | 8.20% | -2.91% | base year |
| Net Income per WLU | 657.6% | 8.64 € | 8.22 € | 7.19 € | 5.93 € | 6.17 € | 2.44 € | 2.93 € | 1.82 € | 0.67 € | 1.14 € |
| Return on Total Assets (ROA) | 854.5% | 12.61% | 9.55% | 8.37% | 8.58% | 10.76% | 3.76% | 4.86% | 2.41% | 0.74% | 1.32% |
| Operating Profit per WLU | 220.9% | 8.68 € | 8.40 € | 7.89 € | 6.12 € | 6.25 € | 3.99 € | 3.86 € | 2.11 € | 0.25 € | 2.70 € |
| Inflation-Adjusted Operating Profit per WLU | 148.4% | 7.83 € | 7.70 € | 7.45 € | 5.97 € | 6.25 € | 4.12 € | 4.09 € | 2.27 € | 0.28 € | 3.15 € |
| Return on Capital Employed (ROCE) | 304.3% | 12.66% | 9.76% | 9.19% | 8.84% | 10.90% | 6.14% | 6.40% | 2.80% | 0.27% | 3.13% |
| Annual Growth ROCE | | 29.66% | 6.24% | 3.90% | -18.87% | 77.61% | -4.11% | 128.96% | 925.51% | -91.29% | base year |

## DUS – Dusseldorf, Germany

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-95 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -3.7% | n/a | n/a | n/a | n/a | 17.18 € | 17.17 € | 16.25 € | 16.21 € | 18.14 € | 17.83 € |
| Inflation-Adjusted Total Cost per WLU | -19.3% | n/a | n/a | n/a | n/a | 17.18 € | 17.47 € | 16.98 € | 17.69 € | 20.81 € | 21.28 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | n/a | n/a | n/a | n/a | -1.68% | 2.89% | -4.03% | -14.96% | -2.22% | base year |
| Operating Cost per WLU | 0.7% | n/a | n/a | n/a | n/a | 14.50 € | 14.77 € | 14.19 € | 13.20 € | 14.86 € | 14.40 € |
| Inflation-Adjusted Operating Cost per WLU | -15.6% | n/a | n/a | n/a | n/a | 14.50 € | 15.02 € | 14.83 € | 14.41 € | 17.04 € | 17.18 € |
| Depreciation Cost per WLU | -22.2% | n/a | n/a | n/a | n/a | 3.33 € | 3.84 € | 2.59 € | 2.43 € | 3.47 € | 4.28 € |
| Inflation-Adjusted Depreciation Cost per WLU | -34.8% | n/a | n/a | n/a | n/a | 3.33 € | 3.90 € | 2.71 € | 2.66 € | 3.98 € | 5.11 € |
| Depreciation Share of Operating Cost | -22.7% | n/a | n/a | n/a | n/a | 23.00% | 25.98% | 18.28% | 18.44% | 23.37% | 29.74% |
| Labour Cost per WLU | 28.0% | n/a | n/a | n/a | n/a | 6.18 € | 6.28 € | 6.42 € | 5.93 € | 5.85 € | 4.83 € |
| Average Labour Cost per Employee | 43.1% | n/a | n/a | n/a | n/a | 41,654 € | 39,318 € | 38,201 € | 34,590 € | 32,199 € | 29,115 € |
| Labour Share of Operating Cost | 27.1% | n/a | n/a | n/a | n/a | 42.65% | 42.51% | 45.20% | 44.96% | 39.38% | 33.56% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 11.8% | n/a | n/a | n/a | n/a | 6,738 | 6,264 | 5,954 | 5,830 | 5,502 | 6,026 |
| Total Revenue per Employee | 0.4% | n/a | n/a | n/a | n/a | 123,955 € | 114,628 € | 107,350 € | 104,155 € | 111,126 € | 123,474 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -20.0% | n/a | n/a | n/a | n/a | 34 | 33 | 31 | 35 | 34 | 43 |
| Total Asset Turnover (Total Revenue / Total Assets) | -28.1% | n/a | n/a | n/a | n/a | 0.634 | 0.598 | 0.565 | 0.623 | 0.678 | 0.883 |
| Annual Growth Total Asset Turnover | | n/a | n/a | n/a | n/a | 6.08% | 5.85% | -9.37% | -8.03% | -23.22% | base year |

## DUS – Dusseldorf, Germany

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-95** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -10.2% | n/a | n/a | n/a | n/a | 18.40 € | 18.30 € | 18.03 € | 17.86 € | 20.20 € | 20.49 € |
| Inflation-Adjusted Total Revenue per WLU | -24.8% | n/a | n/a | n/a | n/a | 18.40 € | 18.62 € | 18.84 € | 19.50 € | 23.16 € | 24.45 € |
| Aeronautical Revenue per WLU | 10.0% | n/a | n/a | n/a | n/a | 12.94 € | 12.93 € | 12.72 € | 12.51 € | 12.46 € | 11.77 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -7.8% | n/a | n/a | n/a | n/a | 12.94 € | 13.15 € | 13.29 € | 13.65 € | 14.28 € | 14.04 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | n/a | n/a | n/a | n/a | -1.58% | -1.04% | -2.68% | -4.41% | 1.73% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 19.8% | n/a | n/a | n/a | n/a | 1,099 € | 1,060 € | 1,026 € | 982 € | 947 € | 918 € |
| Aeronautical Revenue per Air Transport Movement | 18.9% | n/a | n/a | n/a | n/a | 1,215 € | 1,184 € | 1,148 € | 1,094 € | 1,074 € | 1,022 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -30.4% | n/a | n/a | n/a | n/a | 29.64% | 29.36% | 29.46% | 29.99% | 38.33% | 42.57% |
| Annual Growth Non-Aeron. Share of Total Revenue | | n/a | n/a | n/a | n/a | 0.97% | -0.35% | -1.75% | -21.77% | -9.96% | base year |
| Commercial Revenue per Terminal Passenger | -17.3% | n/a | n/a | n/a | n/a | 5.24 € | 5.22 € | 5.34 € | 5.33 € | 6.73 € | 6.34 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -30.7% | n/a | n/a | n/a | n/a | 5.24 € | 5.31 € | 5.58 € | 5.82 € | 7.71 € | 7.57 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -6.8% | n/a | n/a | n/a | n/a | 1.071 | 1.066 | 1.110 | 1.102 | 1.113 | 1.149 |
| Annual Growth RevEx | | n/a | n/a | n/a | n/a | 0.51% | -3.96% | 0.66% | -0.99% | -3.12% | base year |
| Net Income per WLU | -54.1% | n/a | n/a | n/a | n/a | 1.22 € | 1.13 € | 1.78 € | 1.66 € | 2.06 € | 2.66 € |
| Return on Total Assets (ROA) | -63.3% | n/a | n/a | n/a | n/a | 4.21% | 3.68% | 5.58% | 5.78% | 6.90% | 11.45% |
| Operating Profit per WLU | -36.0% | n/a | n/a | n/a | n/a | 3.90 € | 3.53 € | 3.84 € | 4.67 € | 5.34 € | 6.09 € |
| Inflation-Adjusted Operating Profit per WLU | -46.4% | n/a | n/a | n/a | n/a | 3.90 € | 3.59 € | 4.01 € | 5.10 € | 6.12 € | 7.27 € |
| Return on Capital Employed (ROCE) | -48.8% | n/a | n/a | n/a | n/a | 13.45% | 11.54% | 12.02% | 16.29% | 17.90% | 26.24% |
| Annual Growth ROCE | | n/a | n/a | n/a | n/a | 16.52% | -3.96% | -26.23% | -9.00% | -31.79% | base year |

## EDI – Edinburgh, UK

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -12.8% | 9.35 € | 9.62 € | 10.53 € | 9.20 € | 8.55 € | 9.09 € | 9.72 € | 9.53 € | 11.38 € | 10.73 € |
| Inflation-Adjusted Total Cost per WLU | -32.5% | 8.44 € | 8.82 € | 9.95 € | 8.98 € | 8.55 € | 9.38 € | 10.31 € | 10.28 € | 12.67 € | 12.50 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -4.35% | -11.32% | 10.75% | 5.08% | -8.89% | -9.01% | 0.29% | -18.84% | 1.29% | base year |
| Operating Cost per WLU | -14.7% | 8.16 € | 8.22 € | 8.05 € | 7.72 € | 7.19 € | 7.77 € | 8.19 € | 8.16 € | 9.98 € | 9.57 € |
| Inflation-Adjusted Operating Cost per WLU | -34.0% | 7.36 € | 7.53 € | 7.61 € | 7.54 € | 7.19 € | 8.02 € | 8.69 € | 8.80 € | 11.11 € | 11.15 € |
| Depreciation Cost per WLU | 68.5% | 1.36 € | 1.12 € | 1.02 € | 0.66 € | 0.62 € | 0.57 € | 0.52 € | 0.57 € | 0.77 € | 0.81 € |
| Inflation-Adjusted Depreciation Cost per WLU | 30.4% | 1.23 € | 1.02 € | 0.96 € | 0.65 € | 0.62 € | 0.59 € | 0.55 € | 0.61 € | 0.86 € | 0.94 € |
| Depreciation Share of Operating Cost | 97.5% | 16.68% | 13.57% | 12.66% | 8.56% | 8.63% | 7.38% | 6.29% | 6.99% | 7.70% | 8.44% |
| Labour Cost per WLU | -31.8% | 2.81 € | 2.73 € | 2.98 € | 3.01 € | 2.85 € | 2.78 € | 3.31 € | 3.50 € | 4.66 € | 4.12 € |
| Average Labour Cost per Employee | 30.9% | 42,639 € | 40,371 € | 38,809 € | 35,933 € | 31,873 € | 29,887 € | 33,425 € | 33,203 € | 37,713 € | 32,568 € |
| Labour Share of Operating Cost | -20.1% | 34.44% | 33.19% | 37.02% | 38.91% | 39.65% | 35.78% | 40.40% | 42.87% | 46.72% | 43.09% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 92.0% | 15,164 | 14,799 | 13,020 | 11,955 | 11,182 | 10,747 | 10,102 | 9,494 | 8,085 | 7,898 |
| Total Revenue per Employee | 87.0% | 184,482 € | 184,952 € | 161,513 € | 138,343 € | 118,525 € | 122,789 € | 127,239 € | 117,377 € | 109,650 € | 98,662 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -26.4% | 22 | 28 | 35 | 43 | 39 | 39 | 39 | 38 | 30 | 30 |
| Total Asset Turnover (Total Revenue / Total Assets) | -28.3% | 0.270 | 0.347 | 0.434 | 0.502 | 0.410 | 0.443 | 0.492 | 0.474 | 0.404 | 0.377 |
| Annual Growth Total Asset Turnover | | -22.08% | -20.10% | -13.54% | 22.53% | -7.61% | -9.87% | 3.79% | 17.19% | 7.30% | base year |

## EDI – Edinburgh, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -2.6% | 12.17 € | 12.50 € | 12.41 € | 11.57 € | 10.60 € | 11.43 € | 12.60 € | 12.36 € | 13.56 € | 12.49 € |
| Inflation-Adjusted Total Revenue per WLU | -24.6% | 10.97 € | 11.45 € | 11.72 € | 11.30 € | 10.60 € | 11.79 € | 13.36 € | 13.34 € | 15.09 € | 14.56 € |
| Aeronautical Revenue per WLU | -5.9% | 8.39 € | 8.56 € | 8.51 € | 7.57 € | 7.00 € | 7.70 € | 8.63 € | 7.90 € | 9.75 € | 8.92 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -27.2% | 7.57 € | 7.85 € | 8.04 € | 7.40 € | 7.00 € | 7.95 € | 9.16 € | 8.52 € | 10.85 € | 10.39 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -3.59% | -2.38% | 8.71% | 5.70% | -12.00% | -13.18% | 7.43% | -21.42% | 4.39% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 121.1% | 475 € | 438 € | 389 € | 332 € | 240 € | 235 € | 242 € | 194 € | 236 € | 215 € |
| Aeronautical Revenue per Air Transport Movement | 13.9% | 558 € | 565 € | 543 € | 463 € | 404 € | 423 € | 447 € | 381 € | 480 € | 490 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 8.5% | 31.04% | 31.47% | 31.40% | 34.55% | 33.99% | 32.58% | 31.46% | 36.08% | 28.11% | 28.61% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -1.36% | 0.21% | -9.09% | 1.64% | 4.33% | 3.55% | -12.80% | 28.36% | -1.78% | base year |
| Commercial Revenue per Terminal Passenger | 5.3% | 3.77 € | 3.98 € | 4.13 € | 4.26 € | 3.88 € | 4.01 € | 4.22 € | 4.66 € | 3.85 € | 3.58 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -18.5% | 3.40 € | 3.65 € | 3.90 € | 4.16 € | 3.88 € | 4.14 € | 4.48 € | 5.03 € | 4.29 € | 4.17 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 11.7% | 1.301 | 1.298 | 1.178 | 1.258 | 1.240 | 1.257 | 1.296 | 1.297 | 1.191 | 1.164 |
| Annual Growth RevEx | | 0.17% | 10.18% | -6.34% | 1.45% | -1.36% | -3.00% | -0.09% | 8.89% | 2.33% | base year |
| Net Income per WLU | 59.5% | 2.81 € | 2.87 € | 1.88 € | 2.37 € | 2.05 € | 2.34 € | 2.88 € | 2.83 € | 2.18 € | 1.76 € |
| Return on Total Assets (ROA) | 17.4% | 6.25% | 7.97% | 6.57% | 10.30% | 7.93% | 9.07% | 11.24% | 10.86% | 6.50% | 5.32% |
| Operating Profit per WLU | 37.0% | 4.00 € | 4.28 € | 4.35 € | 3.85 € | 3.41 € | 3.65 € | 4.41 € | 4.21 € | 3.58 € | 2.92 € |
| Inflation-Adjusted Operating Profit per WLU | 6.0% | 3.61 € | 3.92 € | 4.11 € | 3.76 € | 3.41 € | 3.77 € | 4.67 € | 4.54 € | 3.98 € | 3.41 € |
| Return on Capital Employed (ROCE) | 0.8% | 8.89% | 11.87% | 15.23% | 16.69% | 13.18% | 14.17% | 17.20% | 16.12% | 10.67% | 8.82% |
| Annual Growth ROCE | | -25.12% | -22.06% | -8.73% | 26.61% | -6.99% | -17.62% | 6.70% | 51.14% | 21.00% | base year |

## EMA – East Midlands, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -34.3% | 8.60 € | 8.82 € | 8.33 € | 7.79 € | 8.32 € | 10.03 € | 12.06 € | 13.68 € | 10.80 € | 13.10 € |
| Inflation-Adjusted Total Cost per WLU | -48.9% | 7.75 € | 8.07 € | 7.89 € | 7.60 € | 8.32 € | 10.38 € | 12.72 € | 14.66 € | 11.93 € | 15.16 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -4.01% | 2.37% | 3.70% | -8.59% | -19.83% | -18.43% | -13.22% | 22.85% | -21.31% | base year |
| Operating Cost per WLU | -37.2% | 7.66 € | 7.40 € | 7.21 € | 6.59 € | 7.23 € | 9.25 € | 10.86 € | 12.54 € | 14.10 € | 12.19 € |
| Inflation-Adjusted Operating Cost per WLU | -51.1% | 6.90 € | 6.77 € | 6.82 € | 6.43 € | 7.23 € | 9.56 € | 11.45 € | 13.44 € | 15.58 € | 14.12 € |
| Depreciation Cost per WLU | -41.7% | 1.20 € | 1.21 € | 1.12 € | 0.90 € | 0.57 € | 0.77 € | 1.29 € | 2.02 € | 2.39 € | 2.06 € |
| Inflation-Adjusted Depreciation Cost per WLU | -54.6% | 1.08 € | 1.11 € | 1.06 € | 0.88 € | 0.57 € | 0.79 € | 1.36 € | 2.16 € | 2.64 € | 2.39 € |
| Depreciation Share of Operating Cost | -7.2% | 15.70% | 16.33% | 15.57% | 13.70% | 7.85% | 8.29% | 11.91% | 16.11% | 16.97% | 16.91% |
| Labour Cost per WLU | -57.6% | 3.09 € | 2.91 € | 3.01 € | 2.86 € | 3.47 € | 5.15 € | 6.07 € | 6.69 € | 8.51 € | 7.31 € |
| Average Labour Cost per Employee | 97.3% | 45,987 € | 41,876 € | 40,706 € | 30,556 € | 30,929 € | 29,698 € | 19,512 € | 21,717 € | 25,128 € | 23,311 € |
| Labour Share of Operating Cost | -32.5% | 40.42% | 39.24% | 41.69% | 43.36% | 48.03% | 55.71% | 55.89% | 53.34% | 60.37% | 59.92% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 365.8% | 14,863 | 14,415 | 13,540 | 10,698 | 8,912 | 5,764 | 3,215 | 3,247 | 2,952 | 3,191 |
| Total Revenue per Employee | 287.3% | 189,219 € | 177,369 € | 157,860 € | 113,294 € | 96,705 € | 70,309 € | 45,665 € | 50,441 € | 49,347 € | 48,850 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -16.6% | 16 | 19 | 20 | 23 | 24 | 25 | 18 | 20 | 17 | 19 |
| Total Asset Turnover (Total Revenue / Total Assets) | -30.6% | 0.200 | 0.230 | 0.228 | 0.245 | 0.259 | 0.302 | 0.249 | 0.313 | 0.279 | 0.289 |
| Annual Growth Total Asset Turnover | | -12.98% | 0.98% | -7.02% | -5.36% | -14.14% | 21.39% | -20.61% | 12.14% | -3.34% | base year |

## EMA – East Midlands, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -16.8% | 12.73 € | 12.30 € | 11.66 € | 10.59 € | 10.85 € | 12.20 € | 14.20 € | 15.53 € | 16.71 € | 15.31 € |
| Inflation-Adjusted Total Revenue per WLU | -35.3% | 11.47 € | 11.26 € | 11.03 € | 10.34 € | 10.85 € | 12.61 € | 14.98 € | 16.65 € | 18.47 € | 17.72 € |
| Aeronautical Revenue per WLU | -24.8% | 8.27 € | 7.57 € | 7.40 € | 7.11 € | 7.23 € | 7.86 € | 9.05 € | 10.85 € | 11.49 € | 10.99 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -41.5% | 7.45 € | 6.92 € | 7.00 € | 6.94 € | 7.23 € | 8.13 € | 9.55 € | 11.62 € | 12.69 € | 12.72 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 7.58% | -1.06% | 0.80% | -3.99% | -11.04% | -14.90% | -17.85% | -8.43% | -0.24% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 60.0% | 414 € | 379 € | 346 € | 307 € | 307 € | 291 € | 311 € | 282 € | 272 € | 259 € |
| Aeronautical Revenue per Air Transport Movement | 30.2% | 662 € | 576 € | 551 € | 493 € | 517 € | 515 € | 584 € | 557 € | 509 € | 508 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 24.3% | 35.07% | 38.51% | 36.57% | 32.89% | 33.37% | 35.58% | 36.26% | 30.17% | 31.28% | 28.21% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -8.94% | 5.31% | 11.19% | -1.46% | -6.20% | -1.88% | 20.19% | -3.57% | 10.92% | base year |
| Commercial Revenue per Terminal Passenger | 44.5% | 7.25 € | 7.68 € | 7.26 € | 5.55 € | 5.38 € | 6.09 € | 6.53 € | 5.50 € | 6.04 € | 5.02 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 12.5% | 6.53 € | 7.03 € | 6.87 € | 5.42 € | 5.38 € | 6.30 € | 6.88 € | 5.90 € | 6.68 € | 5.81 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 26.6% | 1.480 | 1.395 | 1.399 | 1.360 | 1.304 | 1.216 | 1.178 | 1.136 | 1.548 | 1.169 |
| Annual Growth RevEx | | 6.13% | -0.29% | 2.84% | 4.27% | 7.30% | 3.22% | 3.71% | -26.66% | 32.47% | base year |
| Net Income per WLU | 86.8% | 4.13 € | 3.48 € | 3.32 € | 2.80 € | 2.53 € | 2.16 € | 2.14 € | 1.85 € | 5.92 € | 2.21 € |
| Return on Total Assets (ROA) | 55.8% | 6.50% | 6.52% | 6.50% | 6.50% | 6.05% | 5.36% | 3.75% | 3.74% | 9.89% | 4.17% |
| Operating Profit per WLU | 62.8% | 5.08 € | 4.90 € | 4.45 € | 4.00 € | 3.63 € | 2.95 € | 3.34 € | 2.99 € | 2.62 € | 3.12 € |
| Inflation-Adjusted Operating Profit per WLU | 26.7% | 4.57 € | 4.48 € | 4.21 € | 3.91 € | 3.63 € | 3.05 € | 3.53 € | 3.21 € | 2.89 € | 3.61 € |
| Return on Capital Employed (ROCE) | 35.8% | 7.99% | 9.18% | 8.70% | 9.27% | 8.66% | 7.30% | 5.86% | 6.04% | 4.37% | 5.89% |
| Annual Growth ROCE | | -12.90% | 5.44% | -6.17% | 7.07% | 18.66% | 24.64% | -3.03% | 38.10% | -25.68% | base year |

## FRA – Frankfurt, Germany

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 13.6% | 21.91 € | 22.41 € | 22.11 € | 23.38 € | 24.18 € | 24.70 € | 24.06 € | 22.92 € | 22.44 € | 19.29 € |
| Inflation-Adjusted Total Cost per WLU | -9.3% | 20.89 € | 21.48 € | 21.40 € | 23.05 € | 24.18 € | 25.13 € | 25.14 € | 25.03 € | 25.73 € | 23.02 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -2.79% | 0.39% | -7.17% | -4.65% | -3.79% | -0.04% | 0.45% | -2.75% | 11.81% | base year |
| Operating Cost per WLU | 14.9% | 18.61 € | 19.12 € | 19.39 € | 20.43 € | 22.13 € | 22.43 € | 21.78 € | 20.84 € | 19.44 € | 16.20 € |
| Inflation-Adjusted Operating Cost per WLU | -8.2% | 17.74 € | 18.33 € | 18.77 € | 20.15 € | 22.13 € | 22.82 € | 22.76 € | 22.75 € | 22.29 € | 19.33 € |
| Depreciation Cost per WLU | 15.4% | 3.14 € | 3.95 € | 4.05 € | 4.58 € | 5.87 € | 6.08 € | 3.30 € | 3.19 € | 2.99 € | 2.73 € |
| Inflation-Adjusted Depreciation Cost per WLU | -7.8% | 3.00 € | 3.79 € | 3.92 € | 4.52 € | 5.87 € | 6.19 € | 3.45 € | 3.48 € | 3.43 € | 3.25 € |
| Depreciation Share of Operating Cost | 0.4% | 16.90% | 20.67% | 20.87% | 22.43% | 26.53% | 27.12% | 15.14% | 15.30% | 15.38% | 16.83% |
| Labour Cost per WLU | 18.7% | 9.22 € | 9.55 € | 9.40 € | 9.70 € | 9.92 € | 10.62 € | 10.52 € | 10.09 € | 9.57 € | 7.77 € |
| Average Labour Cost per Employee | 49.6% | 44,547 € | 42,790 € | 40,968 € | 41,304 € | 41,939 € | 42,372 € | 39,081 € | 36,282 € | 32,857 € | 29,787 € |
| Labour Share of Operating Cost | 3.4% | 49.56% | 49.94% | 48.50% | 47.48% | 44.81% | 47.33% | 48.33% | 48.42% | 49.21% | 47.96% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 26.0% | 4,831 | 4,482 | 4,357 | 4,258 | 4,229 | 3,991 | 3,713 | 3,596 | 3,435 | 3,835 |
| Total Revenue per Employee | 50.4% | 111,440 € | 104,583 € | 99,920 € | 103,071 € | 104,144 € | 100,091 € | 90,480 € | 81,277 € | 75,822 € | 74,085 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -7.0% | 26 | 26 | 26 | 25 | 24 | 22 | 19 | 21 | 22 | 28 |
| Total Asset Turnover (Total Revenue / Total Assets) | 11.1% | 0.595 | 0.608 | 0.596 | 0.605 | 0.586 | 0.543 | 0.469 | 0.475 | 0.492 | 0.536 |
| Annual Growth Total Asset Turnover | | -2.05% | 1.93% | -1.52% | 3.30% | 7.98% | 15.80% | -1.40% | -3.42% | -8.15% | base year |

## FRA – Frankfurt, Germany

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 19.4% | 23.07 € | 23.34 € | 22.93 € | 24.21 € | 24.63 € | 25.08 € | 24.37 € | 22.60 € | 22.08 € | 19.32 € |
| Inflation-Adjusted Total Revenue per WLU | -4.6% | 21.99 € | 22.37 € | 22.20 € | 23.87 € | 24.63 € | 25.51 € | 25.46 € | 24.67 € | 25.32 € | 23.05 € |
| Aeronautical Revenue per WLU | 14.9% | 15.15 € | 15.22 € | 15.14 € | 16.09 € | 16.13 € | 16.36 € | 16.42 € | 15.29 € | 14.80 € | 13.18 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -8.2% | 14.44 € | 14.59 € | 14.65 € | 15.87 € | 16.13 € | 16.64 € | 17.16 € | 16.70 € | 16.97 € | 15.73 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -1.03% | -0.42% | -7.64% | -1.64% | -3.08% | -2.98% | 2.75% | -1.63% | 7.90% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 25.0% | 2,098 € | 2,076 € | 2,116 € | 2,218 € | 2,221 € | 2,177 € | 2,096 € | 1,913 € | 1,824 € | 1,678 € |
| Aeronautical Revenue per Air Transport Movement | 27.2% | 2,184 € | 2,159 € | 2,201 € | 2,247 € | 2,256 € | 2,220 € | 2,144 € | 1,951 € | 1,868 € | 1,717 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 8.1% | 34.33% | 34.77% | 33.99% | 33.54% | 34.50% | 34.77% | 32.62% | 32.33% | 32.95% | 31.76% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -1.29% | 2.30% | 1.34% | -2.77% | -0.77% | 6.60% | 0.89% | -1.90% | 3.76% | base year |
| Commercial Revenue per Terminal Passenger | 11.3% | 9.23 € | 9.06 € | 9.42 € | 10.20 € | 10.31 € | 10.45 € | 10.29 € | 9.69 € | 9.50 € | 8.29 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -11.1% | 8.79 € | 8.69 € | 9.12 € | 10.06 € | 10.31 € | 10.63 € | 10.76 € | 10.58 € | 10.89 € | 9.89 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 5.1% | 1.053 | 1.041 | 1.037 | 1.036 | 1.019 | 1.015 | 1.013 | 0.986 | 0.984 | 1.002 |
| Annual Growth RevEx | | 1.11% | 0.38% | 0.16% | 1.68% | 0.32% | 0.26% | 2.72% | 0.21% | -1.78% | base year |
| Net Income per WLU | 3709.3% | 1.16 € | 0.93 € | 0.83 € | 0.83 € | 0.45 € | 0.38 € | 0.31 € | -0.32 € | -0.36 € | 0.03 € |
| Return on Total Assets (ROA) | 3443.7% | 2.99% | 2.42% | 2.15% | 2.09% | 1.07% | 0.82% | 0.59% | -0.68% | -0.81% | 0.08% |
| Operating Profit per WLU | 43.0% | 4.46 € | 4.22 € | 3.55 € | 3.78 € | 2.50 € | 2.65 € | 2.59 € | 1.76 € | 2.64 € | 3.12 € |
| Inflation-Adjusted Operating Profit per WLU | 14.2% | 4.25 € | 4.04 € | 3.43 € | 3.72 € | 2.50 € | 2.69 € | 2.70 € | 1.93 € | 3.02 € | 3.73 € |
| Return on Capital Employed (ROCE) | 33.0% | 11.52% | 10.98% | 9.22% | 9.44% | 5.94% | 5.73% | 4.98% | 3.71% | 5.88% | 8.66% |
| Annual Growth ROCE | | 4.88% | 19.08% | -2.33% | 58.88% | 3.76% | 15.02% | 34.15% | -36.88% | -32.10% | base year |

## GLA – Glasgow, UK

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 13.2% | 12.04 € | 12.15 € | 14.01 € | 12.89 € | 12.26 € | 12.33 € | 12.27 € | 12.44 € | 11.84 € | 10.64 € |
| Inflation-Adjusted Total Cost per WLU | -12.4% | 10.86 € | 11.14 € | 13.24 € | 12.59 € | 12.26 € | 12.72 € | 13.01 € | 13.42 € | 13.17 € | 12.40 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -2.46% | -15.86% | 5.16% | 2.66% | -3.63% | -2.23% | -3.04% | 1.90% | 6.18% | base year |
| Operating Cost per WLU | -0.1% | 9.37 € | 9.07 € | 9.76 € | 10.66 € | 9.64 € | 10.90 € | 10.57 € | 10.39 € | 10.84 € | 9.38 € |
| Inflation-Adjusted Operating Cost per WLU | -22.7% | 8.45 € | 8.31 € | 9.22 € | 10.41 € | 9.64 € | 11.25 € | 11.21 € | 11.20 € | 12.06 € | 10.93 € |
| Depreciation Cost per WLU | 96.8% | 1.89 € | 1.88 € | 2.07 € | 1.96 € | 1.83 € | 1.48 € | 1.26 € | 1.08 € | 1.37 € | 0.96 € |
| Inflation-Adjusted Depreciation Cost per WLU | 52.3% | 1.71 € | 1.72 € | 1.95 € | 1.92 € | 1.83 € | 1.53 € | 1.34 € | 1.16 € | 1.52 € | 1.12 € |
| Depreciation Share of Operating Cost | 97.0% | 20.20% | 20.76% | 21.18% | 18.43% | 18.94% | 13.62% | 11.93% | 10.36% | 12.60% | 10.26% |
| Labour Cost per WLU | -34.2% | 3.04 € | 2.98 € | 3.06 € | 2.87 € | 2.60 € | 3.06 € | 3.59 € | 4.41 € | 5.22 € | 4.63 € |
| Average Labour Cost per Employee | 42.9% | 44,423 € | 41,236 € | 39,723 € | 33,988 € | 32,063 € | 31,428 € | 35,621 € | 40,046 € | 36,650 € | 31,080 € |
| Labour Share of Operating Cost | -34.2% | 32.50% | 32.87% | 31.35% | 26.91% | 27.01% | 28.04% | 33.96% | 42.45% | 48.16% | 49.37% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 117.3% | 14,591 | 13,839 | 12,990 | 11,854 | 12,314 | 10,284 | 9,925 | 9,085 | 7,022 | 6,714 |
| Total Revenue per Employee | 123.5% | 218,052 € | 200,086 € | 192,450 € | 176,094 € | 167,762 € | 162,150 € | 164,458 € | 136,925 € | 110,470 € | 97,567 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -30.6% | 19 | 21 | 20 | 21 | 21 | 21 | 22 | 26 | 23 | 27 |
| Total Asset Turnover (Total Revenue / Total Assets) | -28.7% | 0.280 | 0.310 | 0.301 | 0.310 | 0.286 | 0.324 | 0.367 | 0.398 | 0.368 | 0.393 |
| Annual Growth Total Asset Turnover | | -9.74% | 3.09% | -2.77% | 8.12% | -11.68% | -11.72% | -7.74% | 8.21% | -6.33% | base year |

## GLA – Glasgow, UK

### Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 2.8% | 14.94 € | 14.46 € | 14.82 € | 14.86 € | 13.62 € | 15.77 € | 16.57 € | 15.07 € | 15.73 € | 14.53 € |
| Inflation-Adjusted Total Revenue per WLU | -20.4% | 13.48 € | 13.25 € | 14.00 € | 14.51 € | 13.62 € | 16.28 € | 17.58 € | 16.26 € | 17.51 € | 16.94 € |
| Aeronautical Revenue per WLU | -6.5% | 9.46 € | 8.69 € | 8.95 € | 7.97 € | 7.36 € | 9.53 € | 10.14 € | 8.76 € | 10.85 € | 10.12 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -27.6% | 8.54 € | 7.96 € | 8.46 € | 7.78 € | 7.36 € | 9.84 € | 10.76 € | 9.45 € | 12.07 € | 11.80 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 7.23% | -5.90% | 8.72% | 5.70% | -25.16% | -8.57% | 13.90% | -21.74% | 2.33% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 60.8% | 663 € | 575 € | 565 € | 531 € | 454 € | 633 € | 527 € | 422 € | 464 € | 412 € |
| Aeronautical Revenue per Air Transport Movement | 16.2% | 752 € | 691 € | 682 € | 594 € | 556 € | 715 € | 702 € | 569 € | 662 € | 647 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 20.9% | 36.67% | 39.92% | 39.56% | 46.35% | 45.96% | 39.56% | 38.78% | 41.89% | 31.04% | 30.34% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -8.13% | 0.90% | -14.65% | 0.86% | 16.18% | 2.00% | -7.43% | 34.98% | 2.29% | base year |
| Commercial Revenue per Terminal Passenger | 15.9% | 5.06 € | 5.43 € | 5.85 € | 6.89 € | 6.13 € | 6.29 € | 6.54 € | 6.43 € | 4.83 € | 4.37 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -10.3% | 4.57 € | 4.98 € | 5.53 € | 6.73 € | 6.13 € | 6.49 € | 6.93 € | 6.93 € | 5.37 € | 5.09 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -9.1% | 1.241 | 1.190 | 1.057 | 1.152 | 1.111 | 1.279 | 1.351 | 1.211 | 1.329 | 1.365 |
| Annual Growth RevEx | | 4.30% | 12.50% | -8.23% | 3.71% | -13.15% | -5.29% | 11.49% | -8.86% | -2.65% | base year |
| Net Income per WLU | -25.4% | 2.90 € | 2.30 € | 0.81 € | 1.96 € | 1.36 € | 3.44 € | 4.30 € | 2.63 € | 3.90 € | 3.89 € |
| Return on Total Assets (ROA) | -48.3% | 5.44% | 4.95% | 1.64% | 4.09% | 2.86% | 7.08% | 9.54% | 6.95% | 9.11% | 10.51% |
| Operating Profit per WLU | 8.2% | 5.58 € | 5.39 € | 5.06 € | 4.20 € | 3.98 € | 4.87 € | 6.00 € | 4.69 € | 4.89 € | 5.15 € |
| Inflation-Adjusted Operating Profit per WLU | -16.3% | 5.03 € | 4.94 € | 4.78 € | 4.10 € | 3.98 € | 5.02 € | 6.37 € | 5.06 € | 5.45 € | 6.01 € |
| Return on Capital Employed (ROCE) | -25.0% | 10.46% | 11.58% | 10.28% | 8.75% | 8.38% | 10.01% | 13.30% | 12.38% | 11.44% | 13.93% |
| Annual Growth ROCE | | -9.68% | 12.58% | 17.49% | 4.50% | -16.32% | -24.74% | 7.43% | 8.19% | -17.86% | base year |

## GVA – Geneva, Switzerland

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 43.4% | 15.93 € | 12.49 € | 13.27 € | 14.30 € | 13.18 € | 13.18 € | 12.50 € | 12.07 € | 12.09 € | 11.11 € |
| Inflation-Adjusted Total Cost per WLU | 20.1% | 15.59 € | 12.32 € | 13.10 € | 14.19 € | 13.18 € | 13.42 € | 12.83 € | 12.80 € | 13.34 € | 12.98 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 26.55% | -5.95% | -7.67% | 7.66% | -1.83% | 4.64% | 0.24% | -4.07% | 2.77% | base year |
| Operating Cost per WLU | 21.7% | 11.55 € | 12.29 € | 11.34 € | 11.73 € | 11.44 € | 11.38 € | 10.58 € | 10.17 € | 10.44 € | 9.49 € |
| Inflation-Adjusted Operating Cost per WLU | 1.9% | 11.30 € | 12.12 € | 11.20 € | 11.64 € | 11.44 € | 11.59 € | 10.87 € | 10.79 € | 11.52 € | 11.09 € |
| Depreciation Cost per WLU | 17.0% | 2.58 € | 3.17 € | 2.12 € | 2.19 € | 2.62 € | 1.90 € | 1.92 € | 1.95 € | 2.16 € | 2.21 € |
| Inflation-Adjusted Depreciation Cost per WLU | -2.0% | 2.53 € | 3.13 € | 2.10 € | 2.17 € | 2.62 € | 1.94 € | 1.97 € | 2.07 € | 2.39 € | 2.58 € |
| Depreciation Share of Operating Cost | -3.9% | 22.36% | 25.79% | 18.72% | 18.64% | 22.87% | 16.70% | 18.12% | 19.16% | 20.72% | 23.26% |
| Labour Cost per WLU | 32.3% | 4.19 € | 4.32 € | 4.41 € | 4.55 € | 4.28 € | 4.11 € | 3.46 € | 3.37 € | 3.40 € | 3.17 € |
| Average Labour Cost per Employee | 29.1% | 64,112 € | 62,892 € | 63,976 € | 65,598 € | 62,820 € | 58,757 € | 54,768 € | 51,289 € | 49,888 € | 49,672 € |
| Labour Share of Operating Cost | 8.7% | 36.28% | 35.13% | 38.89% | 38.80% | 37.46% | 36.09% | 32.69% | 33.13% | 32.60% | 33.38% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | -2.4% | 15,298 | 14,571 | 14,502 | 14,411 | 14,662 | 14,305 | 15,831 | 15,221 | 14,662 | 15,681 |
| Total Revenue per Employee | 22.1% | 215,104 € | 202,619 € | 201,989 € | 211,089 € | 205,472 € | 192,464 € | 199,273 € | 186,241 € | 178,648 € | 176,176 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | (93-99) -70.8% | 50 | 50 | 67 | 73 | 79 | 119 | 171 | n/a | n/a | n/a |
| Total Asset Turnover (Total Revenue / Total Assets) | (93-99) -67.4% | 0.701 | 0.699 | 0.933 | 1.072 | 1.113 | 1.605 | 2.148 | n/a | n/a | n/a |
| Annual Growth Total Asset Turnover | | 0.20% | -25.02% | -13.01% | -3.68% | -30.64% | -25.31% | base year | n/a | n/a | n/a |

## GVA – Geneva, Switzerland

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 25.2% | 14.06 € | 13.91 € | 13.93 € | 14.65 € | 14.01 € | 13.45 € | 12.59 € | 12.24 € | 12.18 € | 11.23 € |
| Inflation-Adjusted Total Revenue per WLU | 4.8% | 13.76 € | 13.71 € | 13.75 € | 14.53 € | 14.01 € | 13.70 € | 12.92 € | 12.98 € | 13.45 € | 13.12 € |
| Aeronautical Revenue per WLU | 23.8% | 6.87 € | 6.67 € | 6.98 € | 7.36 € | 7.01 € | 6.60 € | 6.33 € | 6.19 € | 6.02 € | 5.55 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 3.7% | 6.72 € | 6.58 € | 6.89 € | 7.30 € | 7.01 € | 6.72 € | 6.50 € | 6.56 € | 6.65 € | 6.48 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 2.08% | -4.43% | -5.67% | 4.11% | 4.36% | 3.42% | -0.98% | -1.27% | 2.58% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 39.0% | 319 € | 308 € | 316 € | 336 € | 332 € | 290 € | 273 € | 256 € | 236 € | 230 € |
| Aeronautical Revenue per Air Transport Movement | 31.9% | 461 € | 443 € | 470 € | 485 € | 483 € | 443 € | 413 € | 390 € | 383 € | 349 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 1.1% | 51.16% | 52.00% | 49.91% | 49.75% | 49.95% | 50.95% | 49.72% | 49.42% | 50.57% | 50.63% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -1.61% | 4.19% | 0.31% | -0.40% | -1.96% | 2.48% | 0.60% | -2.28% | -0.11% | base year |
| Commercial Revenue per Terminal Passenger | 13.4% | 6.83 € | 6.67 € | 6.70 € | 6.85 € | 7.07 € | 6.93 € | 6.50 € | 6.36 € | 6.48 € | 6.02 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -5.0% | 6.68 € | 6.58 € | 6.61 € | 6.79 € | 7.07 € | 7.05 € | 6.67 € | 6.74 € | 7.16 € | 7.03 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -12.7% | 0.882 | 1.113 | 1.050 | 1.024 | 1.063 | 1.021 | 1.007 | 1.014 | 1.008 | 1.011 |
| Annual Growth RevEx | | -20.72% | 6.05% | 2.48% | -3.67% | 4.19% | 1.31% | -0.64% | 0.57% | -0.29% | base year |
| Net Income per WLU | -1628.5% | -1.87 € | 1.41 € | 0.66 € | 0.35 € | 0.83 € | 0.27 € | 0.09 € | 0.17 € | 0.10 € | 0.12 € |
| Return on Total Assets (ROA) | -693.5% | -9.33% | 7.11% | 4.41% | 2.53% | 6.62% | 3.23% | 1.57% | n/a | n/a | n/a |
| Operating Profit per WLU | 43.9% | 2.51 € | 1.62 € | 2.59 € | 2.92 € | 2.58 € | 2.07 € | 2.00 € | 2.07 € | 1.75 € | 1.74 € |
| Inflation-Adjusted Operating Profit per WLU | 20.5% | 2.46 € | 1.60 € | 2.55 € | 2.89 € | 2.58 € | 2.11 € | 2.06 € | 2.19 € | 1.93 € | 2.04 € |
| Return on Capital Employed (ROCE) | (93-99) -63.4% | 12.51% | 8.14% | 17.31% | 21.35% | 20.47% | 24.72% | 34.19% | n/a | n/a | n/a |
| Annual Growth ROCE | | 53.74% | -53.00% | -18.91% | 4.29% | -17.20% | -27.70% | base year | n/a | n/a | n/a |

## HAJ – Hanover, Germany

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 8.1% | 25.40 € | 24.69 € | 23.02 € | 22.13 € | 20.48 € | 20.62 € | 20.35 € | 19.81 € | 18.13 € | 23.49 € |
| Inflation-Adjusted Total Cost per WLU | -13.6% | 24.21 € | 23.67 € | 22.28 € | 21.82 € | 20.48 € | 20.97 € | 21.27 € | 21.63 € | 20.79 € | 28.04 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 2.29% | 6.21% | 2.12% | 6.53% | -2.34% | -1.36% | -1.67% | 4.01% | -25.83% | base year |
| Operating Cost per WLU | 5.0% | 22.77 € | 22.57 € | 19.75 € | 18.80 € | 17.62 € | 17.66 € | 17.48 € | 17.84 € | 15.30 € | 21.68 € |
| Inflation-Adjusted Operating Cost per WLU | -16.1% | 21.71 € | 21.64 € | 19.12 € | 18.54 € | 17.62 € | 17.97 € | 18.26 € | 19.48 € | 17.55 € | 25.87 € |
| Depreciation Cost per WLU | -52.9% | 4.52 € | 3.92 € | 2.77 € | 3.21 € | 3.15 € | 3.15 € | 3.48 € | 3.03 € | 2.64 € | 9.58 € |
| Inflation-Adjusted Depreciation Cost per WLU | -62.3% | 4.30 € | 3.76 € | 2.68 € | 3.17 € | 3.15 € | 3.20 € | 3.64 € | 3.31 € | 3.03 € | 11.43 € |
| Depreciation Share of Operating Cost | -55.1% | 19.83% | 17.38% | 14.01% | 17.08% | 17.86% | 17.81% | 19.93% | 16.99% | 17.24% | 44.18% |
| Labour Cost per WLU | -4.5% | 6.44 € | 6.24 € | 6.15 € | 6.73 € | 7.78 € | 7.49 € | 8.16 € | 7.75 € | 7.21 € | 6.74 € |
| Average Labour Cost per Employee | -4.5% | 28,984 € | 28,877 € | 28,928 € | 31,335 € | 37,718 € | 35,254 € | 36,280 € | 33,155 € | 31,198 € | 30,344 € |
| Labour Share of Operating Cost | -9.1% | 28.27% | 27.63% | 31.16% | 35.81% | 44.17% | 42.41% | 46.69% | 43.45% | 47.14% | 31.10% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 0.0% | 4,502 | 4,630 | 4,700 | 4,654 | 4,846 | 4,706 | 4,446 | 4,276 | 4,325 | 4,501 |
| Total Revenue per Employee | -2.7% | 107,813 € | 109,357 € | 114,756 € | 111,157 € | 106,742 € | 106,036 € | 96,205 € | 84,977 € | 83,859 € | 110,765 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -48.5% | 14 | 13 | 15 | 17 | 21 | 25 | 23 | 25 | 25 | 26 |
| Total Asset Turnover (Total Revenue / Total Assets) | -49.9% | 0.327 | 0.317 | 0.372 | 0.404 | 0.455 | 0.566 | 0.504 | 0.493 | 0.490 | 0.652 |
| Annual Growth Total Asset Turnover | | 2.94% | -14.80% | -7.82% | -11.21% | -19.57% | 12.29% | 2.18% | 0.66% | -24.88% | base year |

## HAJ – Hanover, Germany

### Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -2.7% | 23.95 € | 23.62 € | 24.41 € | 23.88 € | 22.03 € | 22.53 € | 21.64 € | 19.87 € | 19.39 € | 24.61 € |
| Inflation-Adjusted Total Revenue per WLU | -22.3% | 22.83 € | 22.65 € | 23.63 € | 23.55 € | 22.03 € | 22.92 € | 22.61 € | 21.69 € | 22.24 € | 29.37 € |
| Aeronautical Revenue per WLU | 18.9% | 13.52 € | 13.48 € | 13.65 € | 14.36 € | 14.36 € | 13.77 € | 13.55 € | 12.62 € | 12.37 € | 11.37 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -5.0% | 12.89 € | 12.93 € | 13.21 € | 14.16 € | 14.36 € | 14.01 € | 14.16 € | 13.78 € | 14.19 € | 13.56 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -0.32% | -2.18% | -6.68% | -1.37% | 2.49% | -1.05% | 2.71% | -2.86% | 4.61% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 109.4% | 736 € | 751 € | 719 € | 723 € | 661 € | 563 € | 499 € | 429 € | 403 € | 351 € |
| Aeronautical Revenue per Air Transport Movement | 117.0% | 1,051 € | 1,098 € | 1,082 € | 1,093 € | 1,085 € | 1,013 € | 958 € | 853 € | 548 € | 484 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -19.1% | 43.56% | 42.92% | 44.09% | 39.88% | 34.83% | 38.90% | 37.40% | 36.47% | 36.19% | 53.82% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 1.49% | -2.65% | 10.55% | 14.51% | -10.46% | 4.01% | 2.54% | 0.76% | -32.75% | base year |
| Commercial Revenue per Terminal Passenger | 63.3% | 10.34 € | 10.08 € | 10.35 € | 9.81 € | 7.97 € | 7.98 € | 8.37 € | 7.63 € | 7.21 € | 6.33 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 30.5% | 9.86 € | 9.66 € | 10.02 € | 9.68 € | 7.97 € | 8.12 € | 8.74 € | 8.33 € | 8.27 € | 7.56 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -10.0% | 0.943 | 0.957 | 1.061 | 1.079 | 1.075 | 1.093 | 1.063 | 1.003 | 1.069 | 1.048 |
| Annual Growth RevEx | | -1.44% | -9.79% | -1.74% | 0.37% | -1.60% | 2.78% | 6.01% | -6.20% | 2.08% | base year |
| Net Income per WLU | -229.6% | -1.45 € | -1.07 € | 1.40 € | 1.76 € | 1.54 € | 1.92 € | 1.29 € | 0.06 € | 1.26 € | 1.12 € |
| Return on Total Assets (ROA) | -166.7% | -1.97% | -1.43% | 2.13% | 2.97% | 3.19% | 4.81% | 3.00% | 0.15% | 3.18% | 2.96% |
| Operating Profit per WLU | -59.8% | 1.18 € | 1.05 € | 4.66 € | 5.08 € | 4.41 € | 4.87 € | 4.16 € | 2.03 € | 4.09 € | 2.93 € |
| Inflation-Adjusted Operating Profit per WLU | -67.9% | 1.12 € | 1.00 € | 4.51 € | 5.01 € | 4.41 € | 4.95 € | 4.35 € | 2.21 € | 4.69 € | 3.50 € |
| Return on Capital Employed (ROCE) | -79.3% | 1.61% | 1.41% | 7.11% | 8.59% | 9.10% | 12.23% | 9.69% | 5.03% | 10.32% | 7.77% |
| Annual Growth ROCE | | 14.15% | -80.20% | -17.28% | -5.56% | -25.55% | 26.11% | 92.77% | -51.29% | 32.80% | base year |

## HAM – Hamburg, Germany

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 11.2% | 16.49 € | 17.32 € | 17.09 € | 17.32 € | 19.11 € | 19.16 € | 18.85 € | 18.81 € | 16.81 € | 14.83 € |
| Inflation-Adjusted Total Cost per WLU | -11.1% | 15.72 € | 16.61 € | 16.54 € | 17.08 € | 19.11 € | 19.49 € | 19.69 € | 20.53 € | 19.27 € | 17.70 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -5.34% | 0.41% | -3.17% | -10.62% | -1.95% | -1.02% | -4.09% | 6.54% | 8.91% | base year |
| Operating Cost per WLU | 1.4% | 14.30 € | 14.60 € | 14.13 € | 15.72 € | 15.12 € | 16.91 € | 19.40 € | 16.04 € | 15.99 € | 14.10 € |
| Inflation-Adjusted Operating Cost per WLU | -19.0% | 13.64 € | 13.99 € | 13.68 € | 15.50 € | 15.12 € | 17.20 € | 20.27 € | 17.51 € | 18.34 € | 16.83 € |
| Depreciation Cost per WLU | -20.3% | 2.14 € | 1.98 € | 2.17 € | 3.22 € | 3.39 € | 4.37 € | 6.89 € | 3.30 € | 3.48 € | 2.69 € |
| Inflation-Adjusted Depreciation Cost per WLU | -36.3% | 2.04 € | 1.90 € | 2.10 € | 3.18 € | 3.39 € | 4.44 € | 7.20 € | 3.61 € | 3.99 € | 3.21 € |
| Depreciation Share of Operating Cost | -21.4% | 14.98% | 13.55% | 15.35% | 20.49% | 22.40% | 25.83% | 35.54% | 20.60% | 21.75% | 19.07% |
| Labour Cost per WLU | -14.3% | 5.72 € | 6.02 € | 6.37 € | 6.74 € | 6.48 € | 6.75 € | 7.20 € | 8.15 € | 7.84 € | 6.68 € |
| Average Labour Cost per Employee | 80.1% | 52,466 € | 40,855 € | 38,813 € | 37,985 € | 36,674 € | 35,640 € | 35,202 € | 34,120 € | 31,199 € | 29,125 € |
| Labour Share of Operating Cost | -15.5% | 40.00% | 41.23% | 45.05% | 42.88% | 42.84% | 39.91% | 37.11% | 50.84% | 49.05% | 47.34% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 110.2% | 9,170 | 6,789 | 6,096 | 5,635 | 5,661 | 5,281 | 4,890 | 4,185 | 3,977 | 4,363 |
| Total Revenue per Employee | 167.6% | 178,648 € | 134,335 € | 117,351 € | 112,797 € | 115,129 € | 106,375 € | 95,225 € | 75,769 € | 67,835 € | 66,752 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 16.6% | 45 | 45 | 41 | 37 | 33 | 31 | 31 | 30 | 31 | 39 |
| Total Asset Turnover (Total Revenue / Total Assets) | 48.5% | 0.884 | 0.889 | 0.783 | 0.738 | 0.668 | 0.634 | 0.595 | 0.545 | 0.525 | 0.596 |
| Annual Growth Total Asset Turnover | | -0.58% | 13.50% | 6.11% | 10.54% | 5.29% | 6.62% | 9.12% | 3.82% | -11.81% | base year |

## HAM – Hamburg, Germany

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 27.3% | 19.48 € | 19.79 € | 19.25 € | 20.02 € | 20.34 € | 20.14 € | 19.47 € | 18.11 € | 17.06 € | 15.30 € |
| Inflation-Adjusted Total Revenue per WLU | 1.7% | 18.57 € | 18.97 € | 18.63 € | 19.74 € | 20.34 € | 20.49 € | 20.35 € | 19.77 € | 19.56 € | 18.26 € |
| Aeronautical Revenue per WLU | 13.8% | 13.58 € | 13.91 € | 13.78 € | 14.14 € | 14.40 € | 14.42 € | 14.23 € | 14.16 € | 12.86 € | 11.94 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -9.1% | 12.95 € | 13.33 € | 13.34 € | 13.94 € | 14.40 € | 14.67 € | 14.87 € | 15.46 € | 14.75 € | 14.25 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -2.89% | -0.07% | -4.29% | -3.17% | -1.87% | -1.32% | -3.84% | 4.83% | 3.54% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 39.6% | 859 € | 870 € | 815 € | 827 € | 841 € | 827 € | 785 € | 730 € | 633 € | 616 € |
| Aeronautical Revenue per Air Transport Movement | 35.3% | 1,040 € | 1,062 € | 1,004 € | 1,026 € | 1,056 € | 1,042 € | 991 € | 957 € | 821 € | 768 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 37.8% | 30.28% | 29.71% | 28.39% | 29.38% | 29.21% | 28.40% | 26.93% | 21.78% | 24.59% | 21.98% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 1.91% | 4.64% | -3.36% | 0.59% | 2.84% | 5.45% | 23.65% | -11.41% | 11.88% | base year |
| Commercial Revenue per Terminal Passenger | 73.3% | 5.89 € | 5.86 € | 5.58 € | 6.02 € | 5.65 € | 5.57 € | 4.68 € | 3.99 € | 4.20 € | 3.40 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 38.4% | 5.62 € | 5.62 € | 5.40 € | 5.94 € | 5.65 € | 5.67 € | 4.89 € | 4.36 € | 4.82 € | 4.06 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 14.5% | 1.181 | 1.142 | 1.126 | 1.156 | 1.064 | 1.051 | 1.033 | 0.963 | 1.015 | 1.032 |
| Annual Growth RevEx | | 3.43% | 1.38% | -2.52% | 8.60% | 1.22% | 1.74% | 7.33% | -5.14% | -1.64% | base year |
| Net Income per WLU | 533.5% | 2.99 € | 2.46 € | 2.16 € | 2.70 € | 1.22 € | 0.98 € | 0.63 € | -0.70 € | 0.25 € | 0.47 € |
| Return on Total Assets (ROA) | 638.5% | 13.56% | 11.06% | 8.80% | 9.94% | 4.02% | 3.10% | 1.92% | -2.11% | 0.77% | 1.84% |
| Operating Profit per WLU | 331.7% | 5.18 € | 5.19 € | 5.12 € | 4.30 € | 5.22 € | 3.23 € | 0.07 € | 2.07 € | 1.06 € | 1.20 € |
| Inflation-Adjusted Operating Profit per WLU | 244.9% | 4.94 € | 4.98 € | 4.96 € | 4.24 € | 5.22 € | 3.29 € | 0.08 € | 2.26 € | 1.22 € | 1.43 € |
| Return on Capital Employed (ROCE) | 403.3% | 23.50% | 23.33% | 20.83% | 15.85% | 17.13% | 10.19% | 0.22% | 6.23% | 3.27% | 4.67% |
| Annual Growth ROCE | | 0.72% | 11.98% | 31.41% | -7.44% | 68.14% | 4500.78% | -96.45% | 90.25% | -29.87% | base year |

## LBA – Leeds Bradford, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 13.4% | 14.58 € | 13.98 € | 13.38 € | 12.50 € | 12.90 € | 13.66 € | 14.26 € | 14.95 € | 15.26 € | 12.86 € |
| Inflation-Adjusted Total Cost per WLU | -12.2% | 13.16 € | 12.81 € | 12.64 € | 12.21 € | 12.90 € | 14.10 € | 15.13 € | 16.12 € | 16.98 € | 14.98 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 2.67% | 1.37% | 3.55% | -5.40% | -8.52% | -6.77% | -6.17% | -5.02% | 13.30% | base year |
| Operating Cost per WLU | 8.2% | 13.07 € | 12.54 € | 12.23 € | 11.64 € | 12.26 € | 12.87 € | 12.97 € | 14.19 € | 14.62 € | 12.07 € |
| Inflation-Adjusted Operating Cost per WLU | -16.2% | 11.79 € | 11.49 € | 11.56 € | 11.36 € | 12.26 € | 13.29 € | 13.76 € | 15.30 € | 16.27 € | 14.07 € |
| Depreciation Cost per WLU | 2.5% | 2.17 € | 2.20 € | 2.13 € | 2.02 € | 1.90 € | 1.99 € | 2.03 € | 2.23 € | 2.51 € | 2.11 € |
| Inflation-Adjusted Depreciation Cost per WLU | -20.7% | 1.95 € | 2.01 € | 2.01 € | 1.98 € | 1.90 € | 2.05 € | 2.15 € | 2.41 € | 2.80 € | 2.46 € |
| Depreciation Share of Operating Cost | -5.3% | 16.57% | 17.53% | 17.38% | 17.38% | 15.50% | 15.45% | 15.61% | 15.72% | 17.18% | 17.50% |
| Labour Cost per WLU | 19.3% | 6.51 € | 6.12 € | 5.73 € | 5.46 € | 5.76 € | 6.42 € | 6.90 € | 6.80 € | 6.77 € | 5.45 € |
| Average Labour Cost per Employee | 52.7% | 39,242 € | 35,333 € | 34,754 € | 30,663 € | 29,042 € | 29,413 € | 31,374 € | 28,577 € | 27,479 € | 25,706 € |
| Labour Share of Operating Cost | 10.2% | 49.79% | 48.83% | 46.82% | 46.93% | 47.00% | 49.88% | 53.16% | 47.91% | 46.31% | 45.18% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 28.0% | 6,030 | 5,771 | 6,069 | 5,615 | 5,041 | 4,580 | 4,549 | 4,204 | 4,058 | 4,712 |
| Total Revenue per Employee | 35.7% | 105,108 € | 97,588 € | 95,535 € | 76,194 € | 65,726 € | 66,622 € | 72,678 € | 70,064 € | 72,077 € | 77,443 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 13.6% | 21 | 23 | 23 | 25 | 24 | 20 | 18 | 17 | 15 | 18 |
| Total Asset Turnover (Total Revenue / Total Assets) | 20.5% | 0.365 | 0.393 | 0.354 | 0.341 | 0.308 | 0.285 | 0.290 | 0.288 | 0.271 | 0.302 |
| Annual Growth Total Asset Turnover | | -7.29% | 11.02% | 3.98% | 10.50% | 8.27% | -1.72% | 0.63% | 6.43% | -10.56% | base year |

## LBA – Leeds Bradford, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 6.1% | 17.43 € | 16.91 € | 15.74 € | 13.57 € | 13.04 € | 14.55 € | 15.98 € | 16.66 € | 17.76 € | 16.43 € |
| Inflation-Adjusted Total Revenue per WLU | -17.9% | 15.72 € | 15.50 € | 14.87 € | 13.25 € | 13.04 € | 15.02 € | 16.95 € | 17.98 € | 19.76 € | 19.15 € |
| Aeronautical Revenue per WLU | -0.1% | 12.58 € | 11.45 € | 10.78 € | 9.60 € | 9.69 € | 11.35 € | 12.32 € | 12.90 € | 13.40 € | 12.60 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -22.7% | 11.35 € | 10.49 € | 10.18 € | 9.38 € | 9.69 € | 11.71 € | 13.07 € | 13.91 € | 14.91 € | 14.69 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 8.19% | 3.04% | 8.59% | -3.25% | -17.23% | -10.40% | -6.05% | -6.66% | 1.49% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 75.5% | 294 € | 270 € | 238 € | 199 € | 177 € | 183 € | 198 € | 184 € | 166 € | 168 € |
| Aeronautical Revenue per Air Transport Movement | 44.6% | 683 € | 647 € | 541 € | 429 € | 390 € | 374 € | 446 € | 485 € | 452 € | 472 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 19.2% | 27.80% | 32.30% | 31.53% | 29.22% | 25.65% | 22.00% | 22.88% | 22.61% | 24.58% | 23.32% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -13.93% | 2.43% | 7.92% | 13.88% | 16.61% | -3.83% | 1.20% | -8.04% | 5.39% | base year |
| Commercial Revenue per Terminal Passenger | 25.7% | 4.85 € | 5.48 € | 4.99 € | 4.01 € | 3.39 € | 3.26 € | 3.75 € | 3.83 € | 4.40 € | 3.86 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -2.7% | 4.38 € | 5.02 € | 4.72 € | 3.91 € | 3.39 € | 3.36 € | 3.98 € | 4.13 € | 4.89 € | 4.50 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -6.5% | 1.195 | 1.210 | 1.177 | 1.085 | 1.011 | 1.065 | 1.120 | 1.115 | 1.164 | 1.278 |
| Annual Growth RevEx | | -1.19% | 2.79% | 8.41% | 7.41% | -5.07% | -4.98% | 0.49% | -4.24% | -8.92% | base year |
| Net Income per WLU | -20.4% | 2.85 € | 2.93 € | 2.36 € | 1.07 € | 0.14 € | 0.88 € | 1.72 € | 1.72 € | 2.51 € | 3.58 € |
| Return on Total Assets (ROA) | -9.6% | 5.96% | 6.81% | 5.32% | 2.68% | 0.32% | 1.73% | 3.11% | 2.97% | 3.82% | 6.59% |
| Operating Profit per WLU | 0.0% | 4.36 € | 4.37 € | 3.51 € | 1.93 € | 0.78 € | 1.67 € | 3.00 € | 2.48 € | 3.14 € | 4.36 € |
| Inflation-Adjusted Operating Profit per WLU | -22.6% | 3.93 € | 4.01 € | 3.32 € | 1.89 € | 0.78 € | 1.73 € | 3.19 € | 2.67 € | 3.49 € | 5.08 € |
| Return on Capital Employed (ROCE) | 13.7% | 9.12% | 10.17% | 7.90% | 4.85% | 1.85% | 3.27% | 5.45% | 4.28% | 4.78% | 8.02% |
| Annual Growth ROCE | | -10.31% | 28.65% | 62.89% | 162.77% | -43.58% | -39.91% | 27.21% | -10.46% | -40.41% | base year |

## LGW – London Gatwick, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 10.7% | 11.06 € | 12.23 € | 13.50 € | 11.20 € | 10.75 € | 10.96 € | 11.47 € | 9.98 € | 11.06 € | 9.99 € |
| Inflation-Adjusted Total Cost per WLU | -14.3% | 9.98 € | 11.21 € | 12.75 € | 10.93 € | 10.75 € | 11.32 € | 12.17 € | 10.77 € | 12.31 € | 11.65 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -10.94% | -12.13% | 16.63% | 1.66% | -4.95% | -7.04% | 13.02% | -12.50% | 5.68% | base year |
| Operating Cost per WLU | 9.8% | 9.50 € | 10.41 € | 10.81 € | 9.49 € | 9.21 € | 9.85 € | 10.12 € | 8.51 € | 9.96 € | 8.65 € |
| Inflation-Adjusted Operating Cost per WLU | -15.1% | 8.57 € | 9.54 € | 10.21 € | 9.26 € | 9.21 € | 10.17 € | 10.73 € | 9.18 € | 11.08 € | 10.09 € |
| Depreciation Cost per WLU | 7.7% | 1.63 € | 1.40 € | 1.33 € | 1.19 € | 1.36 € | 1.42 € | 1.54 € | 1.63 € | 1.85 € | 1.51 € |
| Inflation-Adjusted Depreciation Cost per WLU | -16.7% | 1.47 € | 1.29 € | 1.26 € | 1.16 € | 1.36 € | 1.47 € | 1.63 € | 1.75 € | 2.05 € | 1.76 € |
| Depreciation Share of Operating Cost | -1.9% | 17.13% | 13.49% | 12.29% | 12.56% | 14.79% | 14.43% | 15.19% | 19.10% | 18.54% | 17.47% |
| Labour Cost per WLU | -10.0% | 2.57 € | 2.54 € | 2.68 € | 2.31 € | 2.29 € | 2.38 € | 2.44 € | 2.43 € | 2.99 € | 2.85 € |
| Average Labour Cost per Employee | 74.1% | 48,949 € | 45,664 € | 42,755 € | 34,158 € | 30,931 € | 30,206 € | 29,927 € | 28,748 € | 32,198 € | 28,110 € |
| Labour Share of Operating Cost | -18.0% | 27.03% | 24.40% | 24.81% | 24.34% | 24.90% | 24.17% | 24.10% | 28.60% | 30.00% | 32.97% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 93.5% | 19,066 | 17,974 | 15,944 | 14,794 | 13,494 | 12,686 | 12,272 | 11,808 | 10,776 | 9,851 |
| Total Revenue per Employee | 119.9% | 279,922 € | 290,281 € | 259,030 € | 209,614 € | 171,825 € | 166,405 € | 167,323 € | 144,711 € | 146,305 € | 127,299 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 1.0% | 19 | 22 | 21 | 23 | 20 | 19 | 20 | 21 | 18 | 19 |
| Total Asset Turnover (Total Revenue / Total Assets) | 14.8% | 0.286 | 0.352 | 0.344 | 0.326 | 0.259 | 0.247 | 0.270 | 0.256 | 0.241 | 0.249 |
| Annual Growth Total Asset Turnover | | -18.67% | 2.14% | 5.61% | 25.99% | 4.92% | -8.52% | 5.16% | 6.49% | -3.38% | base year |

## LGW – London Gatwick, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 13.6% | 14.68 € | 16.15 € | 16.25 € | 14.17 € | 12.73 € | 13.12 € | 13.63 € | 12.25 € | 13.58 € | 12.92 € |
| Inflation-Adjusted Total Revenue per WLU | -12.1% | 13.24 € | 14.80 € | 15.35 € | 13.84 € | 12.73 € | 13.54 € | 14.46 € | 13.22 € | 15.11 € | 15.06 € |
| Aeronautical Revenue per WLU | 23.6% | 5.87 € | 5.04 € | 4.98 € | 4.27 € | 3.94 € | 4.06 € | 4.07 € | 4.51 € | 5.33 € | 4.75 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -4.4% | 5.30 € | 4.62 € | 4.71 € | 4.17 € | 3.94 € | 4.19 € | 4.32 € | 4.87 € | 5.93 € | 5.54 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 14.77% | -1.92% | 12.74% | 5.97% | -6.01% | -2.97% | -11.31% | -17.92% | 7.11% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 40.4% | 771 € | 645 € | 618 € | 524 € | 480 € | 495 € | 488 € | 532 € | 641 € | 550 € |
| Aeronautical Revenue per Air Transport Movement | 34.6% | 799 € | 671 € | 641 € | 551 € | 507 € | 524 € | 516 € | 564 € | 685 € | 594 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -5.1% | 60.00% | 68.82% | 69.34% | 69.83% | 69.07% | 69.05% | 70.14% | 63.17% | 60.73% | 63.23% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -12.81% | -0.76% | -0.70% | 1.10% | 0.02% | -1.55% | 11.04% | 4.01% | -3.95% | base year |
| Commercial Revenue per Terminal Passenger | 8.9% | 9.56 € | 12.01 € | 12.20 € | 10.96 € | 9.63 € | 9.86 € | 10.31 € | 8.27 € | 8.86 € | 8.78 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -15.7% | 8.62 € | 11.01 € | 11.53 € | 10.70 € | 9.63 € | 10.18 € | 10.94 € | 8.92 € | 9.86 € | 10.24 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 2.6% | 1.327 | 1.321 | 1.204 | 1.265 | 1.184 | 1.197 | 1.188 | 1.228 | 1.227 | 1.293 |
| Annual Growth RevEx | | 0.47% | 9.73% | -4.87% | 6.88% | -1.06% | 0.71% | -3.20% | 0.01% | -5.08% | base year |
| Net Income per WLU | 23.5% | 3.62 € | 3.92 € | 2.75 € | 2.97 € | 1.98 € | 2.16 € | 2.16 € | 2.27 € | 2.52 € | 2.93 € |
| Return on Total Assets (ROA) | 24.8% | 7.05% | 8.54% | 5.83% | 6.84% | 4.02% | 4.05% | 4.27% | 4.75% | 4.46% | 5.65% |
| Operating Profit per WLU | 21.4% | 5.18 € | 5.74 € | 5.44 € | 4.68 € | 3.53 € | 3.27 € | 3.52 € | 3.74 € | 3.62 € | 4.27 € |
| Inflation-Adjusted Operating Profit per WLU | -6.0% | 4.68 € | 5.26 € | 5.14 € | 4.57 € | 3.53 € | 3.37 € | 3.73 € | 4.04 € | 4.03 € | 4.98 € |
| Return on Capital Employed (ROCE) | 22.7% | 10.10% | 12.49% | 11.52% | 10.78% | 7.17% | 6.14% | 6.95% | 7.83% | 6.42% | 8.23% |
| Annual Growth ROCE | | -19.15% | 8.41% | 6.94% | 50.32% | 16.74% | -11.68% | -11.21% | 22.03% | -22.04% | base year |

## LHR – London Heathrow, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 44.7% | 13.17 € | 11.59 € | 12.70 € | 10.76 € | 9.50 € | 10.10 € | 10.36 € | 8.89 € | 9.96 € | 9.10 € |
| Inflation-Adjusted Total Cost per WLU | 12.0% | 11.88 € | 10.62 € | 12.00 € | 10.51 € | 9.50 € | 10.43 € | 10.99 € | 9.59 € | 11.08 € | 10.61 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 11.79% | -11.48% | 14.22% | 10.64% | -8.94% | -5.10% | 14.57% | -13.40% | 4.44% | base year |
| Operating Cost per WLU | 38.6% | 10.42 € | 9.61 € | 9.90 € | 8.63 € | 8.10 € | 8.26 € | 8.65 € | 7.06 € | 8.04 € | 7.52 € |
| Inflation-Adjusted Operating Cost per WLU | 7.3% | 9.40 € | 8.81 € | 9.36 € | 8.42 € | 8.10 € | 8.53 € | 9.17 € | 7.62 € | 8.95 € | 8.77 € |
| Depreciation Cost per WLU | 89.8% | 2.12 € | 1.66 € | 1.14 € | 0.85 € | 0.85 € | 0.85 € | 0.87 € | 0.93 € | 1.11 € | 1.12 € |
| Inflation-Adjusted Depreciation Cost per WLU | 46.9% | 1.91 € | 1.53 € | 1.08 € | 0.83 € | 0.85 € | 0.87 € | 0.92 € | 1.01 € | 1.23 € | 1.30 € |
| Depreciation Share of Operating Cost | 36.9% | 20.34% | 17.31% | 11.56% | 9.81% | 10.50% | 10.24% | 10.06% | 13.20% | 13.78% | 14.86% |
| Labour Cost per WLU | -11.8% | 2.26 € | 2.32 € | 2.37 € | 2.09 € | 1.98 € | 1.88 € | 2.06 € | 2.13 € | 3.14 € | 2.56 € |
| Average Labour Cost per Employee | 69.6% | 50,521 € | 47,477 € | 45,599 € | 38,370 € | 35,366 € | 33,233 € | 33,837 € | 33,907 € | 40,208 € | 29,788 € |
| Labour Share of Operating Cost | -36.3% | 21.70% | 24.13% | 23.98% | 24.27% | 24.49% | 22.79% | 23.83% | 30.17% | 39.09% | 34.08% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 92.2% | 22,337 | 20,468 | 19,201 | 18,326 | 17,831 | 17,642 | 16,421 | 15,910 | 12,790 | 11,621 |
| Total Revenue per Employee | 156.6% | 381,062 € | 327,290 € | 313,566 € | 274,891 € | 245,172 € | 244,511 € | 235,499 € | 206,411 € | 182,276 € | 148,495 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -38.8% | 15 | 16 | 16 | 20 | 20 | 22 | 22 | 26 | 25 | 24 |
| Total Asset Turnover (Total Revenue / Total Assets) | -18.2% | 0.248 | 0.250 | 0.265 | 0.303 | 0.280 | 0.300 | 0.310 | 0.339 | 0.352 | 0.304 |
| Annual Growth Total Asset Turnover | | -0.73% | -5.51% | -12.61% | 8.11% | -6.58% | -3.41% | -8.39% | -3.67% | 15.88% | base year |

## LHR – London Heathrow, UK

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 33.5% | 17.06 € | 15.99 € | 16.33 € | 15.00 € | 13.75 € | 13.86 € | 14.34 € | 12.97 € | 14.25 € | 12.78 € |
| Inflation-Adjusted Total Revenue per WLU | 3.3% | 15.39 € | 14.66 € | 15.43 € | 14.65 € | 13.75 € | 14.31 € | 15.21 € | 14.00 € | 15.86 € | 14.89 € |
| Aeronautical Revenue per WLU | 27.1% | 6.90 € | 6.26 € | 5.92 € | 5.17 € | 4.67 € | 4.82 € | 5.09 € | 5.33 € | 6.35 € | 5.43 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -1.6% | 6.22 € | 5.73 € | 5.59 € | 5.05 € | 4.67 € | 4.97 € | 5.40 € | 5.75 € | 7.06 € | 6.32 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 8.55% | 2.55% | 10.75% | 8.20% | -6.17% | -7.96% | -5.98% | -18.62% | 11.63% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 64.3% | 1,136 € | 1,024 € | 950 € | 795 € | 707 € | 706 € | 708 € | 707 € | 800 € | 691 € |
| Aeronautical Revenue per Air Transport Movement | 57.7% | 1,157 € | 1,047 € | 974 € | 820 € | 733 € | 732 € | 737 € | 742 € | 844 € | 733 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 3.5% | 59.56% | 60.88% | 63.77% | 65.53% | 66.07% | 65.25% | 64.49% | 58.94% | 55.48% | 57.54% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -2.17% | -4.53% | -2.70% | -0.81% | 1.26% | 1.17% | 9.41% | 6.25% | -3.58% | base year |
| Commercial Revenue per Terminal Passenger | 43.2% | 11.92 € | 11.37 € | 12.40 € | 11.59 € | 10.70 € | 10.63 € | 10.68 € | 8.82 € | 8.96 € | 8.33 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 10.8% | 10.75 € | 10.42 € | 11.72 € | 11.32 € | 10.70 € | 10.97 € | 11.33 € | 9.51 € | 9.97 € | 9.71 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -7.7% | 1.296 | 1.379 | 1.286 | 1.394 | 1.448 | 1.372 | 1.384 | 1.459 | 1.431 | 1.404 |
| Annual Growth RevEx | | -6.07% | 7.30% | -7.77% | -3.72% | 5.54% | -0.91% | -5.11% | 1.92% | 1.94% | base year |
| Net Income per WLU | 5.9% | 3.89 € | 4.40 € | 3.63 € | 4.24 € | 4.25 € | 3.76 € | 3.98 € | 4.08 € | 4.30 € | 3.68 € |
| Return on Total Assets (ROA) | -35.2% | 5.66% | 6.88% | 5.88% | 8.56% | 8.66% | 8.12% | 8.62% | 10.66% | 10.60% | 8.74% |
| Operating Profit per WLU | 26.2% | 6.64 € | 6.38 € | 6.43 € | 6.37 € | 5.65 € | 5.59 € | 5.69 € | 5.91 € | 6.21 € | 5.26 € |
| Inflation-Adjusted Operating Profit per WLU | -2.3% | 5.99 € | 5.84 € | 6.07 € | 6.22 € | 5.65 € | 5.78 € | 6.04 € | 6.37 € | 6.91 € | 6.13 € |
| Return on Capital Employed (ROCE) | -22.7% | 9.65% | 9.97% | 10.41% | 12.87% | 11.51% | 12.10% | 12.33% | 15.43% | 15.33% | 12.49% |
| Annual Growth ROCE | | -3.17% | -4.25% | -19.07% | 11.79% | -4.91% | -1.81% | -20.13% | 0.70% | 22.71% | base year |

## LPL – Liverpool, UK

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -35.9% | 9.56 € | 10.55 € | 9.70 € | 9.08 € | 10.12 € | 10.71 € | 11.11 € | 11.53 € | 15.53 € | 14.90 € |
| Inflation-Adjusted Total Cost per WLU | -51.4% | 8.56 € | 9.60 € | 9.15 € | 8.86 € | 10.12 € | 11.07 € | 11.77 € | 12.41 € | 17.33 € | 17.62 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -10.80% | 4.96% | 3.22% | -12.43% | -8.60% | -5.90% | -5.18% | -28.38% | -1.64% | base year |
| Operating Cost per WLU | -43.1% | 8.90 € | 10.36 € | 9.78 € | 9.19 € | 10.42 € | 11.23 € | 12.08 € | 13.40 € | 17.18 € | 15.65 € |
| Inflation-Adjusted Operating Cost per WLU | -56.9% | 7.98 € | 9.43 € | 9.23 € | 8.98 € | 10.42 € | 11.61 € | 12.79 € | 14.43 € | 19.17 € | 18.50 € |
| Depreciation Cost per WLU | -50.4% | 0.98 € | 1.03 € | 1.01 € | 0.75 € | 0.87 € | 0.88 € | 1.00 € | 1.13 € | 1.51 € | 1.98 € |
| Inflation-Adjusted Depreciation Cost per WLU | -62.4% | 0.88 € | 0.94 € | 0.95 € | 0.73 € | 0.87 € | 0.91 € | 1.06 € | 1.22 € | 1.69 € | 2.34 € |
| Depreciation Share of Operating Cost | -12.8% | 11.01% | 9.92% | 10.34% | 8.18% | 8.39% | 7.82% | 8.25% | 8.44% | 8.81% | 12.62% |
| Labour Cost per WLU | -24.7% | 3.32 € | 0.36 € | 0.35 € | 0.27 € | 0.29 € | 1.40 € | 3.62 € | 4.35 € | 4.85 € | 4.42 € |
| Average Labour Cost per Employee | 52.0% | 34,400 € | 40,401 € | 46,065 € | 41,826 € | 47,274 € | 21,930 € | 23,210 € | 24,730 € | 24,970 € | 22,635 € |
| Labour Share of Operating Cost | 32.3% | 37.34% | 3.48% | 3.60% | 2.97% | 2.82% | 12.46% | 29.96% | 32.48% | 28.24% | 28.23% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 101.9% | 10,346 | 112,245 | 130,895 | 153,254 | 161,215 | 15,676 | 6,414 | 5,680 | 5,147 | 5,124 |
| Total Revenue per Employee | 19.2% | 83,748 € | 1,108,961€ | 1,174,065€ | 1,251,779€ | 1,197,345€ | 117,389 € | 51,605 € | 56,519 € | 67,474 € | 70,250 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 44.4% | 26 | 25 | 36 | 32 | 29 | 22 | 18 | 15 | 14 | 18 |
| Total Asset Turnover (Total Revenue / Total Assets) | -14.8% | 0.213 | 0.250 | 0.321 | 0.265 | 0.215 | 0.164 | 0.145 | 0.144 | 0.188 | 0.250 |
| Annual Growth Total Asset Turnover | | -14.84% | -22.10% | 21.28% | 23.36% | 31.01% | 12.99% | 0.43% | -23.14% | -24.83% | base year |

## LPL – Liverpool, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -41.0% | 8.09 € | 9.88 € | 8.97 € | 8.17 € | 7.43 € | 7.49 € | 8.05 € | 9.95 € | 13.11 € | 13.71 € |
| Inflation-Adjusted Total Revenue per WLU | -55.2% | 7.25 € | 8.99 € | 8.46 € | 7.98 € | 7.43 € | 7.74 € | 8.52 € | 10.71 € | 14.63 € | 16.21 € |
| Aeronautical Revenue per WLU | -22.8% | 5.52 € | 7.17 € | 6.92 € | 6.41 € | 5.95 € | 5.74 € | 5.96 € | 6.96 € | 7.21 € | 7.15 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -41.4% | 4.95 € | 6.53 € | 6.53 € | 6.26 € | 5.95 € | 5.93 € | 6.32 € | 7.49 € | 8.05 € | 8.45 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -24.15% | -0.04% | 4.23% | 5.21% | 0.35% | -6.08% | -15.65% | -6.95% | -4.79% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 124.8% | 132 € | 118 € | 93 € | 83 € | 63 € | 60 € | 59 € | 61 € | 65 € | 59 € |
| Aeronautical Revenue per Air Transport Movement | 58.9% | 369 € | 345 € | 276 € | 255 € | 246 € | 233 € | 239 € | 257 € | 241 € | 232 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -33.6% | 31.76% | 27.44% | 22.84% | 21.48% | 19.84% | 23.39% | 25.89% | 30.08% | 45.00% | 47.84% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 15.72% | 20.16% | 6.33% | 8.25% | -15.18% | -9.65% | -13.94% | -33.15% | -5.94% | base year |
| Commercial Revenue per Terminal Passenger | -66.9% | 3.29 € | 3.91 € | 3.14 € | 2.78 € | 2.26 € | 2.36 € | 1.80 € | 1.69 € | 6.56 € | 9.92 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -74.9% | 2.95 € | 3.56 € | 2.96 € | 2.72 € | 2.26 € | 2.44 € | 1.91 € | 1.82 € | 7.32 € | 11.73 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -7.9% | 0.847 | 0.937 | 0.925 | 0.900 | 0.734 | 0.699 | 0.724 | 0.863 | 0.844 | 0.920 |
| Annual Growth RevEx | | -9.59% | 1.28% | 2.75% | 22.64% | 4.94% | -3.44% | -16.07% | 2.21% | -8.21% | base year |
| Net Income per WLU | -22.6% | -1.46 € | -0.67 € | -0.73 € | -0.91 € | -2.69 € | -3.22 € | -3.06 € | -1.58 € | -2.42 € | -1.19 € |
| Return on Total Assets (ROA) | -77.1% | -3.85% | -1.69% | -2.61% | -2.94% | -7.78% | -7.04% | -5.52% | -2.29% | -3.46% | -2.18% |
| Operating Profit per WLU | 58.3% | -0.81 € | -0.48 € | -0.81 € | -1.03 € | -2.99 € | -3.74 € | -4.03 € | -3.45 € | -4.07 € | -1.94 € |
| Inflation-Adjusted Operating Profit per WLU | 68.4% | -0.72 € | -0.43 € | -0.77 € | -1.00 € | -2.99 € | -3.87 € | -4.27 € | -3.72 € | -4.54 € | -2.29 € |
| Return on Capital Employed (ROCE) | 39.8% | -2.13% | -1.21% | -2.90% | -3.32% | -8.64% | -8.18% | -7.26% | -5.01% | -5.83% | -3.53% |
| Annual Growth ROCE | | -76.25% | 58.42% | 12.59% | 61.52% | -5.61% | -12.59% | -44.95% | 14.01% | -64.88% | base year |

## LTN – Luton, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-97 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -2.4% | n/a | n/a | 15.40 € | 14.67 € | 17.85 € | 18.51 € | 18.07 € | 16.28 € | 17.48 € | 15.78 € |
| Inflation-Adjusted Total Cost per WLU | -20.9% | n/a | n/a | 14.55 € | 14.32 € | 17.85 € | 19.11 € | 19.17 € | 17.56 € | 19.45 € | 18.39 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | n/a | n/a | 1.61% | -19.75% | -6.60% | -0.29% | 9.16% | -9.71% | 5.76% | base year |
| Operating Cost per WLU | -8.7% | n/a | n/a | 13.10 € | 13.11 € | 16.63 € | 17.49 € | 17.47 € | 15.41 € | 16.09 € | 14.35 € |
| Inflation-Adjusted Operating Cost per WLU | -26.0% | n/a | n/a | 12.38 € | 12.80 € | 16.63 € | 18.06 € | 18.54 € | 16.62 € | 17.90 € | 16.72 € |
| Depreciation Cost per WLU | -45.5% | n/a | n/a | 1.10 € | 1.15 € | 1.50 € | 1.66 € | 1.63 € | 2.28 € | 2.77 € | 2.03 € |
| Inflation-Adjusted Depreciation Cost per WLU | -55.8% | n/a | n/a | 1.04 € | 1.12 € | 1.50 € | 1.71 € | 1.73 € | 2.46 € | 3.09 € | 2.36 € |
| Depreciation Share of Operating Cost | -40.3% | n/a | n/a | 8.42% | 8.76% | 9.03% | 9.49% | 9.33% | 14.79% | 17.25% | 14.11% |
| Labour Cost per WLU | 6.4% | n/a | n/a | 6.94 € | 6.31 € | 7.07 € | 7.63 € | 7.66 € | 7.10 € | 7.42 € | 6.52 € |
| Average Labour Cost per Employee | 30.0% | n/a | n/a | 36,934 € | 32,448 € | 28,834 € | 29,024 € | 28,693 € | 27,827 € | 29,728 € | 28,404 € |
| Labour Share of Operating Cost | 16.6% | n/a | n/a | 52.95% | 48.13% | 42.52% | 43.59% | 43.85% | 46.10% | 46.09% | 45.41% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 22.2% | n/a | n/a | 5,325 | 5,141 | 4,078 | 3,806 | 3,745 | 3,918 | 4,009 | 4,359 |
| Total Revenue per Employee | 42.0% | n/a | n/a | 90,741 € | 81,991 € | 71,702 € | 67,930 € | 63,423 € | 63,803 € | 68,498 € | 63,916 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 5.7% | n/a | n/a | 31 | 30 | 24 | 22 | 21 | 23 | 22 | 29 |
| Total Asset Turnover (Total Revenue / Total Assets) | 22.9% | n/a | n/a | 0.521 | 0.479 | 0.429 | 0.391 | 0.363 | 0.368 | 0.380 | 0.424 |
| Annual Growth Total Asset Turnover | | n/a | n/a | 8.70% | 11.75% | 9.61% | 7.72% | -1.38% | -3.24% | -10.23% | base year |

## LTN – Luton, UK

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-97** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 16.2% | n/a | n/a | 17.04 € | 15.95 € | 17.58 € | 17.85 € | 16.93 € | 16.28 € | 17.09 € | 14.66 € |
| Inflation-Adjusted Total Revenue per WLU | -5.8% | n/a | n/a | 16.10 € | 15.57 € | 17.58 € | 18.43 € | 17.96 € | 17.57 € | 19.01 € | 17.09 € |
| Aeronautical Revenue per WLU | 15.2% | n/a | n/a | 8.70 € | 8.35 € | 9.71 € | 10.12 € | 9.97 € | 9.65 € | 9.80 € | 7.55 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -6.6% | n/a | n/a | 8.22 € | 8.15 € | 9.71 € | 10.44 € | 10.58 € | 10.41 € | 10.90 € | 8.80 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | n/a | n/a | 0.78% | -15.99% | -7.06% | -1.27% | 1.65% | -4.52% | 23.83% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 46.4% | n/a | n/a | 494 € | 414 € | 443 € | 485 € | 540 € | 427 € | 452 € | 338 € |
| Aeronautical Revenue per Air Transport Movement | 34.8% | n/a | n/a | 753 € | 695 € | 850 € | 1,053 € | 1,055 € | 783 € | 825 € | 559 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 0.9% | n/a | n/a | 48.96% | 47.64% | 44.80% | 43.31% | 41.11% | 40.75% | 42.67% | 48.50% |
| Annual Growth Non-Aeron. Share of Total Revenue | | n/a | n/a | 2.77% | 6.34% | 3.42% | 5.35% | 0.89% | -4.49% | -12.02% | base year |
| Commercial Revenue per Terminal Passenger | 11.5% | n/a | n/a | 8.96 € | 8.19 € | 8.39 € | 8.28 € | 7.67 € | 7.50 € | 8.46 € | 8.03 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -9.6% | n/a | n/a | 8.46 € | 7.99 € | 8.39 € | 8.55 € | 8.13 € | 8.09 € | 9.42 € | 9.36 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 19.0% | n/a | n/a | 1.106 | 1.087 | 0.985 | 0.964 | 0.937 | 1.000 | 0.978 | 0.929 |
| Annual Growth RevEx | | n/a | n/a | 1.75% | 10.37% | 2.18% | 2.87% | -6.30% | 2.32% | 5.18% | base year |
| Net Income per WLU | 247.3% | n/a | n/a | 1.64 € | 1.28 € | -0.26 € | -0.66 € | -1.13 € | 0.01 € | -0.39 € | -1.11 € |
| Return on Total Assets (ROA) | 255.7% | n/a | n/a | 5.00% | 3.85% | -0.64% | -1.45% | -2.43% | 0.01% | -0.87% | -3.21% |
| Operating Profit per WLU | 1154.0% | n/a | n/a | 3.94 € | 2.84 € | 0.96 € | 0.35 € | -0.54 € | 0.88 € | 1.00 € | 0.31 € |
| Inflation-Adjusted Operating Profit per WLU | 916.6% | n/a | n/a | 3.72 € | 2.77 € | 0.96 € | 0.37 € | -0.57 € | 0.95 € | 1.11 € | 0.37 € |
| Return on Capital Employed (ROCE) | 1225.8% | n/a | n/a | 12.04% | 8.51% | 2.33% | 0.78% | -1.15% | 1.98% | 2.22% | 0.91% |
| Annual Growth ROCE | | n/a | n/a | 41.41% | 265.70% | 199.80% | 167.36% | -158.12% | -10.62% | 144.37% | base year |

## MAN – Manchester, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 40.9% | 19.35 € | 18.05 € | 18.29 € | 15.41 € | 14.17 € | 15.25 € | 16.01 € | 13.31 € | 15.99 € | 13.73 € |
| Inflation-Adjusted Total Cost per WLU | 9.1% | 17.46 € | 16.54 € | 17.28 € | 15.05 € | 14.17 € | 15.74 € | 16.99 € | 14.36 € | 17.79 € | 16.01 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 5.54% | -4.27% | 14.85% | 6.16% | -9.98% | -7.33% | 18.33% | -19.30% | 11.15% | base year |
| Operating Cost per WLU | 31.7% | 16.78 € | 15.14 € | 15.64 € | 13.26 € | 12.13 € | 12.88 € | 13.81 € | 12.34 € | 14.09 € | 12.74 € |
| Inflation-Adjusted Operating Cost per WLU | 1.9% | 15.13 € | 13.88 € | 14.78 € | 12.95 € | 12.13 € | 13.30 € | 14.65 € | 13.32 € | 15.67 € | 14.85 € |
| Depreciation Cost per WLU | 79.9% | 4.38 € | 4.03 € | 3.83 € | 3.39 € | 3.17 € | 2.84 € | 3.07 € | 2.17 € | 2.63 € | 2.43 € |
| Inflation-Adjusted Depreciation Cost per WLU | 39.3% | 3.95 € | 3.69 € | 3.62 € | 3.31 € | 3.17 € | 2.93 € | 3.25 € | 2.35 € | 2.92 € | 2.84 € |
| Depreciation Share of Operating Cost | 36.6% | 26.11% | 26.62% | 24.48% | 25.60% | 26.15% | 22.04% | 22.22% | 17.61% | 18.64% | 19.11% |
| Labour Cost per WLU | -3.1% | 5.12 € | 4.18 € | 4.88 € | 4.20 € | 3.94 € | 4.45 € | 4.38 € | 5.03 € | 5.60 € | 5.29 € |
| Average Labour Cost per Employee | 30.3% | 38,838 € | 34,328 € | 37,735 € | 29,297 € | 27,705 € | 31,085 € | 29,258 € | 30,896 € | 32,252 € | 29,811 € |
| Labour Share of Operating Cost | -26.5% | 30.53% | 27.57% | 31.17% | 31.66% | 32.43% | 34.58% | 31.74% | 40.78% | 39.73% | 41.52% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 34.5% | 7,581 | 8,222 | 7,740 | 6,979 | 7,040 | 6,979 | 6,676 | 6,138 | 5,763 | 5,636 |
| Total Revenue per Employee | 69.7% | 158,101 € | 166,274 € | 156,004 € | 119,191 € | 109,443 € | 114,460 € | 113,000 € | 103,065 € | 105,444 € | 93,146 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -34.1% | 14 | 16 | 15 | 17 | 20 | 19 | 18 | 18 | 18 | 21 |
| Total Asset Turnover (Total Revenue / Total Assets) | -16.9% | 0.282 | 0.321 | 0.301 | 0.298 | 0.305 | 0.306 | 0.311 | 0.294 | 0.331 | 0.339 |
| Annual Growth Total Asset Turnover | | -12.37% | 6.82% | 1.04% | -2.22% | -0.35% | -1.77% | 5.65% | -11.03% | -2.32% | base year |

## MAN – Manchester, UK

### Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 26.2% | 20.85 € | 20.22 € | 20.16 € | 17.08 € | 15.54 € | 16.40 € | 16.93 € | 16.79 € | 18.30 € | 16.53 € |
| Inflation-Adjusted Total Revenue per WLU | -2.3% | 18.81 € | 18.53 € | 19.04 € | 16.68 € | 15.54 € | 16.93 € | 17.96 € | 18.11 € | 20.36 € | 19.26 € |
| Aeronautical Revenue per WLU | 8.0% | 11.75 € | 10.98 € | 11.29 € | 9.55 € | 9.16 € | 9.86 € | 10.45 € | 10.78 € | 12.04 € | 10.88 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -16.4% | 10.60 € | 10.06 € | 10.67 € | 9.33 € | 9.16 € | 10.18 € | 11.09 € | 11.63 € | 13.40 € | 12.68 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 5.31% | -5.66% | 14.31% | 1.80% | -9.98% | -8.21% | -4.65% | -13.20% | 5.68% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 49.5% | 1,171 € | 1,107 € | 1,124 € | 902 € | 843 € | 894 € | 912 € | 886 € | 879 € | 783 € |
| Aeronautical Revenue per Air Transport Movement | 31.0% | 1,268 € | 1,206 € | 1,274 € | 1,028 € | 958 € | 1,026 € | 1,052 € | 1,044 € | 1,039 € | 968 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 27.8% | 43.68% | 45.71% | 44.00% | 44.05% | 41.04% | 39.87% | 38.23% | 35.79% | 34.18% | 34.17% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -4.46% | 3.91% | -0.13% | 7.34% | 2.94% | 4.29% | 6.83% | 4.71% | 0.03% | base year |
| Commercial Revenue per Terminal Passenger | 59.4% | 9.71 € | 9.80 € | 9.44 € | 7.96 € | 6.74 € | 6.97 € | 6.93 € | 6.42 € | 6.70 € | 6.09 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 23.4% | 8.76 € | 8.98 € | 8.92 € | 7.77 € | 6.74 € | 7.20 € | 7.35 € | 6.93 € | 7.45 € | 7.10 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -10.5% | 1.078 | 1.120 | 1.102 | 1.108 | 1.097 | 1.075 | 1.057 | 1.262 | 1.144 | 1.203 |
| Annual Growth RevEx | | -3.83% | 1.67% | -0.57% | 1.06% | 1.99% | 1.75% | -16.23% | 10.25% | -4.91% | base year |
| Net Income per WLU | -46.3% | 1.50 € | 2.17 € | 1.87 € | 1.67 € | 1.37 € | 1.15 € | 0.91 € | 3.48 € | 2.31 € | 2.79 € |
| Return on Total Assets (ROA) | -64.6% | 2.03% | 3.45% | 2.79% | 2.91% | 2.69% | 2.14% | 1.68% | 6.11% | 4.18% | 5.73% |
| Operating Profit per WLU | 7.7% | 4.08 € | 5.08 € | 4.51 € | 3.82 € | 3.41 € | 3.52 € | 3.12 € | 4.45 € | 4.21 € | 3.79 € |
| Inflation-Adjusted Operating Profit per WLU | -16.7% | 3.68 € | 4.66 € | 4.27 € | 3.73 € | 3.41 € | 3.64 € | 3.31 € | 4.80 € | 4.69 € | 4.41 € |
| Return on Capital Employed (ROCE) | -29.1% | 5.51% | 8.07% | 6.74% | 6.66% | 6.69% | 6.56% | 5.74% | 7.80% | 7.62% | 7.76% |
| Annual Growth ROCE | | -31.81% | 19.81% | 1.14% | -0.34% | 1.87% | 14.42% | -26.47% | 2.39% | -1.88% | base year |

## MRS – Marseille, France

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 37.3% | 9.59 € | 10.08 € | 9.34 € | 9.32 € | 9.50 € | 9.33 € | 8.84 € | 8.70 € | 7.86 € | 6.99 € |
| Inflation-Adjusted Total Cost per WLU | 17.6% | 9.17 € | 9.69 € | 9.05 € | 9.14 € | 9.50 € | 9.49 € | 9.15 € | 9.19 € | 8.49 € | 7.80 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -5.45% | 7.17% | -1.05% | -3.76% | [illegible] | 3.74% | -0.43% | 8.21% | 8.93% | base year |
| Operating Cost per WLU | 42.5% | 8.65 € | 8.52 € | 8.16 € | 7.87 € | 7.83 € | 7.69 € | 7.24 € | 6.83 € | 6.70 € | 6.07 € |
| Inflation-Adjusted Operating Cost per WLU | 22.1% | 8.27 € | 8.20 € | 7.90 € | 7.71 € | 7.83 € | 7.82 € | 7.49 € | 7.21 € | 7.25 € | 6.77 € |
| Depreciation Cost per WLU | 57.3% | 3.16 € | 3.07 € | 2.94 € | 2.73 € | 2.75 € | 2.76 € | 2.68 € | 2.30 € | 2.24 € | 2.01 € |
| Inflation-Adjusted Depreciation Cost per WLU | 34.7% | 3.02 € | 2.96 € | 2.84 € | 2.68 € | 2.75 € | 2.81 € | 2.78 € | 2.43 € | 2.42 € | 2.24 € |
| Depreciation Share of Operating Cost | 10.4% | 36.56% | 36.05% | 35.99% | 34.72% | 35.08% | 35.95% | 37.06% | 33.76% | 33.40% | 33.13% |
| Labour Cost per WLU | 25.3% | 2.33 € | 2.44 € | 2.48 € | 2.43 € | 2.37 € | 2.33 € | 2.20 € | 2.12 € | 2.12 € | 1.86 € |
| Average Labour Cost per Employee | 47.6% | 43,720 € | 42,513 € | 40,753 € | 39,367 € | 39,203 € | 37,871 € | 35,313 € | 33,316 € | 30,770 € | 29,614 € |
| Labour Share of Operating Cost | -12.1% | 26.92% | 28.68% | 30.38% | 30.84% | 30.33% | 30.29% | 30.41% | 31.08% | 31.58% | 30.62% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 17.8% | 18,780 | 17,388 | 16,449 | 16,225 | 16,517 | 16,255 | 16,047 | 15,701 | 14,538 | 15,939 |
| Total Revenue per Employee | 54.5% | 171,611 € | 166,515 € | 141,047 € | 140,664 € | 148,338 € | 138,690 € | 133,225 € | 122,093 € | 106,995 € | 111,057 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -36.7% | 41 | 38 | 39 | 43 | 43 | 41 | 43 | 42 | 46 | 65 |
| Total Asset Turnover (Total Revenue / Total Assets) | -17.0% | 0.376 | 0.364 | 0.333 | 0.370 | 0.383 | 0.351 | 0.354 | 0.323 | 0.337 | 0.453 |
| Annual Growth Total Asset Turnover | | 3.39% | 9.09% | -10.00% | -3.24% | 8.94% | -0.60% | 9.36% | -4.13% | -25.55% | base year |

## MRS – Marseille, France

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 31.1% | 9.14 € | 9.58 € | 8.57 € | 8.67 € | 8.98 € | 8.53 € | 8.30 € | 7.78 € | 7.36 € | 6.97 € |
| Inflation-Adjusted Total Revenue per WLU | 12.3% | 8.74 € | 9.21 € | 8.31 € | 8.50 € | 8.98 € | 8.68 € | 8.59 € | 8.21 € | 7.96 € | 7.78 € |
| Aeronautical Revenue per WLU | 26.3% | 3.51 € | 3.17 € | 3.08 € | 3.24 € | 3.29 € | 3.13 € | 3.05 € | 2.98 € | 2.82 € | 2.78 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 8.2% | 3.36 € | 3.05 € | 2.99 € | 3.17 € | 3.29 € | 3.19 € | 3.16 € | 3.15 € | 3.05 € | 3.10 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 10.11% | 2.05% | -5.93% | -3.65% | 3.42% | 0.80% | 0.36% | 3.40% | -1.83% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 38.6% | 185 € | 162 € | 151 € | 163 € | 159 € | 162 € | 155 € | 144 € | 124 € | 134 € |
| Aeronautical Revenue per Air Transport Movement | 1.1% | 254 € | 222 € | 219 € | 238 € | 249 € | 263 € | 259 € | 251 € | 233 € | 251 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 2.5% | 61.59% | 66.90% | 64.06% | 62.65% | 63.31% | 63.30% | 63.22% | 61.65% | 61.72% | 60.10% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -7.94% | 4.44% | 2.25% | -1.05% | 0.03% | 0.11% | 2.56% | -0.12% | 2.69% | base year |
| Commercial Revenue per Terminal Passenger | 34.8% | 5.57 € | 5.59 € | 5.51 € | 5.57 € | 5.76 € | 5.51 € | 5.18 € | 4.82 € | 4.59 € | 4.13 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 15.5% | 5.32 € | 5.37 € | 5.34 € | 5.46 € | 5.76 € | 5.61 € | 5.37 € | 5.09 € | 4.97 € | 4.61 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -4.4% | 0.953 | 0.950 | 0.918 | 0.930 | 0.945 | 0.914 | 0.939 | 0.894 | 0.937 | 0.997 |
| Annual Growth RevEx | | 0.35% | 3.41% | -1.21% | -1.67% | 3.40% | -2.65% | 5.12% | -4.62% | -6.07% | base year |
| Net Income per WLU | -2471.0% | -0.45 € | -0.51 € | -0.76 € | -0.66 € | -0.52 € | -0.80 € | -0.54 € | -0.93 € | -0.50 € | -0.02 € |
| Return on Total Assets (ROA) | -1527.5% | -1.85% | -1.92% | -2.96% | -2.80% | -2.21% | -3.29% | -2.28% | -3.85% | -2.27% | -0.11% |
| Operating Profit per WLU | -45.7% | 0.49 € | 1.05 € | 0.42 € | 0.80 € | 1.15 € | 0.84 € | 1.07 € | 0.95 € | 0.66 € | 0.90 € |
| Inflation-Adjusted Operating Profit per WLU | -53.5% | 0.47 € | 1.01 € | 0.41 € | 0.79 € | 1.15 € | 0.86 € | 1.10 € | 1.00 € | 0.71 € | 1.00 € |
| Return on Capital Employed (ROCE) | -65.6% | 2.01% | 4.00% | 1.63% | 3.43% | 4.92% | 3.47% | 4.54% | 3.95% | 3.01% | 5.85% |
| Annual Growth ROCE | | -49.63% | 145.54% | -52.56% | -30.32% | 41.99% | -23.66% | 15.08% | 30.92% | -48.48% | base year |

## NAP – Naples, Italy

### Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 7.3% | 10.93 € | 9.46 € | 10.01 € | 10.58 € | 10.21 € | 10.77 € | 11.39 € | 13.08 € | 12.78 € | 10.19 € |
| Inflation-Adjusted Total Cost per WLU | -23.9% | 9.94 € | 8.74 € | 9.44 € | 10.17 € | 10.21 € | 11.33 € | 12.47 € | 14.98 € | 15.42 € | 13.07 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 13.69% | -7.34% | -7.23% | -0.34% | -9.94% | -9.11% | -16.75% | -2.86% | 18.00% | base year |
| Operating Cost per WLU | 9.4% | 10.72 € | 8.87 € | 9.33 € | 9.81 € | 10.01 € | 10.94 € | 10.51 € | 11.80 € | 12.44 € | 9.80 € |
| Inflation-Adjusted Operating Cost per WLU | -22.4% | 9.74 € | 8.20 € | 8.79 € | 9.43 € | 10.01 € | 11.51 € | 11.51 € | 13.52 € | 15.00 € | 12.56 € |
| Depreciation Cost per WLU | 255.9% | 0.95 € | 0.83 € | 0.71 € | 0.64 € | 0.58 € | 0.50 € | 0.41 € | 0.42 € | 0.39 € | 0.27 € |
| Inflation-Adjusted Depreciation Cost per WLU | 152.4% | 0.86 € | 0.76 € | 0.67 € | 0.62 € | 0.58 € | 0.53 € | 0.45 € | 0.48 € | 0.46 € | 0.34 € |
| Depreciation Share of Operating Cost | 225.3% | 8.84% | 9.31% | 7.61% | 6.54% | 5.76% | 4.60% | 3.92% | 3.55% | 3.10% | 2.72% |
| Labour Cost per WLU | -19.8% | 5.36 € | 4.83 € | 5.68 € | 6.23 € | 6.63 € | 7.44 € | 7.42 € | 8.37 € | 7.52 € | 6.69 € |
| Average Labour Cost per Employee | 17.8% | 40,460 € | 40,558 € | 41,215 € | 38,550 € | 35,247 € | 38,929 € | 37,033 € | 40,768 € | 35,577 € | 34,333 € |
| Labour Share of Operating Cost | -26.7% | 50.03% | 54.42% | 60.90% | 63.55% | 66.25% | 68.00% | 70.60% | 70.94% | 60.47% | 68.30% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 47.0% | 7,544 | 8,401 | 7,256 | 6,183 | 5,317 | 5,234 | 4,991 | 4,869 | 4,731 | 5,131 |
| Total Revenue per Employee | 79.1% | 92,085 € | 85,297 € | 77,893 € | 68,464 € | 57,198 € | 56,959 € | 58,989 € | 68,070 € | 59,896 € | 51,426 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -50.7% | 65 | 77 | 83 | 75 | 75 | 91 | 82 | 72 | 85 | 132 |
| Total Asset Turnover (Total Revenue / Total Assets) | -40.0% | 0.797 | 0.785 | 0.893 | 0.835 | 0.809 | 0.991 | 0.967 | 1.001 | 1.078 | 1.328 |
| Annual Growth Total Asset Turnover | | 1.58% | -12.10% | 6.92% | 3.23% | -18.42% | 2.50% | -3.38% | -7.13% | -18.82% | base year |

## NAP – Naples, Italy

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 21.8% | 12.21 € | 10.15 € | 10.73 € | 11.07 € | 10.76 € | 10.88 € | 11.82 € | 13.98 € | 12.66 € | 10.02 € |
| Inflation-Adjusted Total Revenue per WLU | -13.6% | 11.10 € | 9.38 € | 10.12 € | 10.65 € | 10.76 € | 11.46 € | 12.95 € | 16.02 € | 15.27 € | 12.85 € |
| Aeronautical Revenue per WLU | 57.1% | 9.41 € | 8.01 € | 8.76 € | 8.95 € | 8.19 € | 8.35 € | 8.92 € | 10.03 € | 7.59 € | 5.99 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | 11.4% | 8.56 € | 7.41 € | 8.26 € | 8.60 € | 8.19 € | 8.79 € | 9.77 € | 11.49 € | 9.16 € | 7.69 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 15.57% | -10.34% | -4.00% | 5.11% | -6.81% | -10.09% | -14.93% | 25.45% | 19.14% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 45.5% | 595 € | 573 € | 555 € | 573 € | 586 € | 606 € | 635 € | 635 € | 501 € | 409 € |
| Aeronautical Revenue per Air Transport Movement | 51.5% | 718 € | 697 € | 688 € | 712 € | 673 € | 681 € | 723 € | 797 € | 598 € | 474 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -43.1% | 22.87% | 21.07% | 18.35% | 19.18% | 23.90% | 23.31% | 24.52% | 28.28% | 40.05% | 40.18% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 8.51% | 14.83% | -4.30% | -19.75% | 2.51% | -4.94% | -13.28% | -29.39% | -0.33% | base year |
| Commercial Revenue per Terminal Passenger | -30.6% | 2.76 € | 2.12 € | 1.95 € | 2.13 € | 2.59 € | 2.61 € | 2.98 € | 3.93 € | 3.90 € | 3.97 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -50.8% | 2.51 € | 1.96 € | 1.84 € | 2.05 € | 2.59 € | 2.74 € | 3.27 € | 4.50 € | 4.70 € | 5.10 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 13.5% | 1.116 | 1.073 | 1.072 | 1.047 | 1.054 | 1.011 | 1.038 | 1.069 | 0.990 | 0.983 |
| Annual Growth RevEx | | 4.02% | 0.10% | 2.43% | -0.69% | 4.27% | -2.64% | -2.90% | 7.95% | 0.74% | base year |
| Net Income per WLU | 839.4% | 1.27 € | 0.69 € | 0.72 € | 0.49 € | 0.55 € | 0.12 € | 0.43 € | 0.90 € | -0.12 € | -0.17 € |
| Return on Total Assets (ROA) | 464.4% | 8.30% | 5.35% | 6.01% | 3.72% | 4.14% | 1.05% | 3.55% | 6.47% | -1.05% | -2.28% |
| Operating Profit per WLU | 560.8% | 1.49 € | 1.28 € | 1.41 € | 1.26 € | 0.75 € | -0.06 € | 1.31 € | 2.18 € | 0.22 € | 0.23 € |
| Inflation-Adjusted Operating Profit per WLU | 368.6% | 1.35 € | 1.18 € | 1.33 € | 1.21 € | 0.75 € | -0.06 € | 1.43 € | 2.49 € | 0.27 € | 0.29 € |
| Return on Capital Employed (ROCE) | 225.7% | 9.71% | 9.90% | 11.71% | 9.52% | 5.65% | -0.51% | 10.71% | 15.59% | 1.91% | 2.98% |
| Annual Growth ROCE | | -1.95% | -15.40% | 22.98% | 68.39% | 1205.90% | -104.77% | -31.31% | 718.29% | -36.10% | base year |

## NCL – Newcastle, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 9.6% | 15.07 € | 14.00 € | 15.12 € | 13.58 € | 11.78 € | 12.40 € | 13.74 € | 13.49 € | 15.23 € | 13.75 € |
| Inflation-Adjusted Total Cost per WLU | -15.2% | 13.60 € | 12.83 € | 14.28 € | 13.26 € | 11.78 € | 12.80 € | 14.57 € | 14.56 € | 16.94 € | 16.03 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 5.96% | -10.15% | 7.69% | 12.57% | -7.95% | -12.17% | 0.13% | -14.10% | 5.71% | base year |
| Operating Cost per WLU | 6.9% | 13.77 € | 12.24 € | 13.18 € | 11.74 € | 10.14 € | 10.71 € | 12.29 € | 11.91 € | 13.85 € | 12.88 € |
| Inflation-Adjusted Operating Cost per WLU | -17.2% | 12.42 € | 11.21 € | 12.45 € | 11.46 € | 10.14 € | 11.05 € | 13.03 € | 12.85 € | 15.41 € | 15.01 € |
| Depreciation Cost per WLU | 16.1% | 3.17 € | 2.81 € | 3.44 € | 2.92 € | 2.29 € | 2.27 € | 2.41 € | 2.44 € | 2.98 € | 2.73 € |
| Inflation-Adjusted Depreciation Cost per WLU | -10.2% | 2.86 € | 2.58 € | 3.25 € | 2.85 € | 2.29 € | 2.35 € | 2.56 € | 2.63 € | 3.31 € | 3.19 € |
| Depreciation Share of Operating Cost | 8.5% | 23.04% | 22.98% | 26.08% | 24.85% | 22.61% | 21.24% | 19.61% | 20.44% | 21.48% | 21.23% |
| Labour Cost per WLU | -5.9% | 6.50 € | 6.71 € | 6.65 € | 5.92 € | 5.20 € | 5.46 € | 6.33 € | 6.24 € | 7.28 € | 6.91 € |
| Average Labour Cost per Employee | 57.8% | 39,199 € | 35,950 € | 32,375 € | 29,173 € | 26,026 € | 26,301 € | 26,982 € | 26,511 € | 27,159 € | 24,836 € |
| Labour Share of Operating Cost | -12.1% | 47.23% | 54.85% | 50.43% | 50.44% | 51.28% | 50.97% | 51.51% | 52.36% | 52.53% | 53.70% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 67.8% | 6,027 | 5,357 | 4,871 | 4,926 | 5,008 | 4,819 | 4,264 | 4,250 | 3,733 | 3,592 |
| Total Revenue per Employee | 90.8% | 109,413 € | 98,780 € | 90,473 € | 78,272 € | 74,509 € | 75,811 € | 71,428 € | 71,563 € | 66,452 € | 57,348 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -6.3% | 22 | 24 | 24 | 27 | 31 | 29 | 28 | 28 | 24 | 24 |
| Total Asset Turnover (Total Revenue / Total Assets) | 6.5% | 0.404 | 0.442 | 0.438 | 0.429 | 0.458 | 0.461 | 0.461 | 0.469 | 0.431 | 0.379 |
| Annual Growth Total Asset Turnover | | -8.75% | 1.03% | 2.15% | -6.34% | -0.79% | -0.07% | -1.55% | 8.67% | 13.82% | base year |

## NCL – Newcastle, UK

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 13.7% | 18.15 € | 18.44 € | 18.57 € | 15.89 € | 14.88 € | 15.73 € | 16.75 € | 16.84 € | 17.80 € | 15.96 € |
| Inflation-Adjusted Total Revenue per WLU | -12.0% | 16.38 € | 16.90 € | 17.55 € | 15.52 € | 14.88 € | 16.24 € | 17.77 € | 18.16 € | 19.81 € | 18.61 € |
| Aeronautical Revenue per WLU | 5.8% | 12.73 € | 13.27 € | 13.56 € | 11.62 € | 10.99 € | 11.71 € | 12.55 € | 12.64 € | 13.39 € | 12.04 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -18.1% | 11.48 € | 12.16 € | 12.81 € | 11.35 € | 10.99 € | 12.09 € | 13.31 € | 13.64 € | 14.90 € | 14.03 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -5.57% | -5.07% | 12.90% | 3.29% | -9.12% | -9.18% | -2.41% | -8.44% | 6.17% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 56.0% | 474 € | 497 € | 441 € | 355 € | 370 € | 388 € | 351 € | 361 € | 332 € | 304 € |
| Aeronautical Revenue per Air Transport Movement | 29.2% | 900 € | 958 € | 871 € | 727 € | 772 € | 819 € | 684 € | 747 € | 710 € | 696 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 21.4% | 29.87% | 28.04% | 27.00% | 26.87% | 26.16% | 25.56% | 25.10% | 24.91% | 24.80% | 24.60% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 6.52% | 3.84% | 0.51% | 2.70% | 2.37% | 1.81% | 0.77% | 0.43% | 0.84% | base year |
| Commercial Revenue per Terminal Passenger | 37.0% | 5.50 € | 5.25 € | 5.10 € | 4.35 € | 3.97 € | 4.07 € | 4.27 € | 4.26 € | 4.51 € | 4.01 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | 6.0% | 4.96 € | 4.81 € | 4.82 € | 4.24 € | 3.97 € | 4.20 € | 4.53 € | 4.60 € | 5.02 € | 4.68 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 3.7% | 1.204 | 1.317 | 1.229 | 1.170 | 1.263 | 1.269 | 1.219 | 1.248 | 1.169 | 1.161 |
| Annual Growth RevEx | | -8.55% | 7.17% | 5.04% | -7.37% | -0.46% | 4.03% | -2.29% | 6.74% | 0.72% | base year |
| Net Income per WLU | 39.1% | 3.08 € | 4.44 € | 3.46 € | 2.31 € | 3.10 € | 3.33 € | 3.01 € | 3.35 € | 2.58 € | 2.21 € |
| Return on Total Assets (ROA) | 30.3% | 6.84% | 10.64% | 8.15% | 6.22% | 9.52% | 9.76% | 8.30% | 9.31% | 6.24% | 5.25% |
| Operating Profit per WLU | 41.8% | 4.38 € | 6.20 € | 5.39 € | 4.15 € | 4.74 € | 5.02 € | 4.47 € | 4.92 € | 3.95 € | 3.09 € |
| Inflation-Adjusted Operating Profit per WLU | 9.8% | 3.95 € | 5.69 € | 5.10 € | 4.05 € | 4.74 € | 5.19 € | 4.74 € | 5.31 € | 4.40 € | 3.60 € |
| Return on Capital Employed (ROCE) | 32.8% | 9.74% | 14.88% | 12.71% | 11.19% | 14.58% | 14.72% | 12.30% | 13.71% | 9.57% | 7.33% |
| Annual Growth ROCE | | -34.53% | 17.06% | 13.62% | -23.29% | -0.95% | 19.69% | -10.25% | 43.20% | 30.54% | base year |

## RIA – AerRianta Group, Ireland

## Partial Factor Productivity (PFP)

| **Group 1: Cost Efficiency** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 4.7% | 19.15 € | 17.70 € | 19.77 € | 19.36 € | 19.85 € | 21.45 € | 22.57 € | 22.24 € | 22.24 € | 18.29 € |
| Inflation-Adjusted Total Cost per WLU | -13.9% | 17.83 € | 16.75 € | 19.17 € | 19.03 € | 19.85 € | 21.99 € | 23.68 € | 23.66 € | 24.40 € | 20.70 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | 6.47% | -12.64% | 0.71% | -4.11% | -9.74% | -7.14% | 0.10% | -3.05% | 17.86% | base year |
| Operating Cost per WLU | 1.8% | 18.58 € | 17.70 € | 19.80 € | 19.44 € | 19.82 € | 21.19 € | 21.93 € | 21.50 € | 21.57 € | 18.25 € |
| Inflation-Adjusted Operating Cost per WLU | -16.3% | 17.30 € | 16.75 € | 19.20 € | 19.12 € | 19.82 € | 21.73 € | 23.01 € | 22.87 € | 23.67 € | 20.66 € |
| Depreciation Cost per WLU | 127.6% | 1.33 € | 1.06 € | 1.13 € | 1.08 € | 1.23 € | 1.26 € | 0.99 € | 0.93 € | 0.84 € | 0.58 € |
| Inflation-Adjusted Depreciation Cost per WLU | 87.2% | 1.23 € | 1.00 € | 1.10 € | 1.06 € | 1.23 € | 1.30 € | 1.04 € | 0.99 € | 0.92 € | 0.66 € |
| Depreciation Share of Operating Cost | 123.6% | 7.14% | 5.98% | 5.72% | 5.56% | 6.18% | 5.97% | 4.53% | 4.31% | 3.88% | 3.19% |
| Labour Cost per WLU | -5.1% | 6.12 € | 5.62 € | 6.59 € | 6.27 € | 6.29 € | 7.13 € | 7.56 € | 7.91 € | 8.25 € | 6.45 € |
| Average Labour Cost per Employee | 71.1% | 31,806 € | 28,701 € | 33,054 € | 28,614 € | 26,211 € | 25,742 € | 24,406 € | 24,954 € | 23,044 € | 18,594 € |
| Labour Share of Operating Cost | -6.8% | 32.94% | 31.75% | 33.29% | 32.26% | 31.73% | 33.64% | 34.48% | 36.81% | 38.27% | 35.34% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 80.3% | 5,198 | 5,108 | 5,014 | 4,562 | 4,167 | 3,610 | 3,228 | 3,154 | 2,792 | 2,883 |
| Total Revenue per Employee | 68.3% | 111,329 € | 110,262 € | 119,508 € | 106,451 € | 98,507 € | 90,205 € | 82,560 € | 79,600 € | 73,055 € | 66,162 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -40.1% | 26 | 28 | 28 | 36 | 37 | 37 | 37 | 38 | 36 | 43 |
| Total Asset Turnover (Total Revenue / Total Assets) | -44.1% | 0.556 | 0.598 | 0.660 | 0.838 | 0.881 | 0.913 | 0.947 | 0.963 | 0.929 | 0.995 |
| Annual Growth Total Asset Turnover | | -7.04% | -9.32% | -21.29% | -4.89% | -3.45% | -3.59% | -1.65% | 3.61% | -6.57% | base year |

## RIA – AerRianta Group, Ireland

## Partial Factor Productivity (PFP) cont'd

| **Group 4: Revenue Generation** | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -6.7% | 21.42 € | 21.58 € | 23.83 € | 23.33 € | 23.64 € | 24.99 € | 25.57 € | 25.24 € | 26.17 € | 22.95 € |
| Inflation-Adjusted Total Revenue per WLU | -23.2% | 19.94 € | 20.43 € | 23.11 € | 22.94 € | 23.64 € | 25.61 € | 26.83 € | 26.86 € | 28.71 € | 25.98 € |
| Aeronautical Revenue per WLU | -45.6% | 3.75 € | 3.57 € | 3.78 € | 3.81 € | 4.93 € | 5.50 € | 6.34 € | 6.76 € | 6.97 € | 6.90 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -55.3% | 3.49 € | 3.38 € | 3.67 € | 3.75 € | 4.93 € | 5.64 € | 6.65 € | 7.19 € | 7.64 € | 7.81 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 3.25% | -7.79% | -2.09% | -24.09% | -12.44% | -15.30% | -7.46% | -5.94% | -2.15% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 12.3% | 246 € | 230 € | 230 € | 208 € | 267 € | 266 € | 278 € | 257 € | 212 € | 219 € |
| Aeronautical Revenue per Air Transport Movement | -20.9% | 330 € | 304 € | 306 € | 293 € | 376 € | 388 € | 432 € | 441 € | 426 € | 417 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | 18.0% | 82.49% | 83.44% | 84.12% | 83.67% | 79.12% | 77.99% | 75.20% | 73.22% | 73.37% | 69.93% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -1.14% | -0.81% | 0.54% | 5.75% | 1.45% | 3.71% | 2.70% | -0.20% | 4.92% | base year |
| Commercial Revenue per Terminal Passenger | 13.4% | 17.12 € | 17.46 € | 17.40 € | 16.76 € | 15.71 € | 15.80 € | 17.09 € | 16.10 € | 16.14 € | 15.10 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -6.8% | 15.94 € | 16.52 € | 16.87 € | 16.48 € | 15.71 € | 16.20 € | 17.93 € | 17.13 € | 17.70 € | 17.10 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -10.9% | 1.119 | 1.220 | 1.205 | 1.205 | 1.191 | 1.165 | 1.133 | 1.135 | 1.177 | 1.255 |
| Annual Growth RevEx | | -8.30% | 1.20% | 0.00% | 1.22% | 2.25% | 2.79% | -0.19% | -3.52% | -6.24% | base year |
| Net Income per WLU | -51.3% | 2.27 € | 3.89 € | 4.06 € | 3.98 € | 3.79 € | 3.53 € | 3.00 € | 3.00 € | 3.93 € | 4.66 € |
| Return on Total Assets (ROA) | -70.8% | 5.89% | 10.78% | 11.24% | 14.29% | 14.13% | 12.90% | 11.11% | 11.46% | 13.94% | 20.20% |
| Operating Profit per WLU | -39.5% | 2.84 € | 3.89 € | 4.03 € | 3.89 € | 3.82 € | 3.79 € | 3.65 € | 3.74 € | 4.60 € | 4.70 € |
| Inflation-Adjusted Operating Profit per WLU | -50.3% | 2.65 € | 3.68 € | 3.91 € | 3.83 € | 3.82 € | 3.89 € | 3.83 € | 3.98 € | 5.04 € | 5.32 € |
| Return on Capital Employed (ROCE) | -63.8% | 7.38% | 10.78% | 11.16% | 13.98% | 14.23% | 13.86% | 13.50% | 14.28% | 16.33% | 20.37% |
| Annual Growth ROCE | | -31.55% | -3.40% | -20.20% | -1.72% | 2.70% | 2.64% | -5.47% | -12.54% | -19.84% | base year |

## STN – Stansted, UK

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | 50.3% | 10.56 € | 11.15 € | 13.44 € | 17.51 € | 18.69 € | 19.68 € | 23.27 € | 27.38 € | 28.29 € | 7.02 € |
| Inflation-Adjusted Total Cost per WLU | 16.3% | 9.52 € | 10.22 € | 12.70 € | 17.10 € | 18.69 € | 20.31 € | 24.68 € | 29.54 € | 31.48 € | 8.18 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -6.84% | -19.53% | -25.70% | -8.53% | -7.98% | -17.71% | -16.43% | -6.17% | 284.58% | base year |
| Operating Cost per WLU | -65.9% | 9.77 € | 9.83 € | 12.13 € | 13.68 € | 14.80 € | 17.10 € | 20.68 € | 22.64 € | 29.42 € | 28.62 € |
| Inflation-Adjusted Operating Cost per WLU | -73.6% | 8.81 € | 9.01 € | 11.46 € | 13.36 € | 14.80 € | 17.65 € | 21.94 € | 24.43 € | 32.74 € | 33.36 € |
| Depreciation Cost per WLU | -36.2% | 2.04 € | 2.16 € | 2.99 € | 2.71 € | 3.64 € | 3.99 € | 5.65 € | 7.20 € | 7.16 € | 3.20 € |
| Inflation-Adjusted Depreciation Cost per WLU | -50.7% | 1.84 € | 1.98 € | 2.82 € | 2.65 € | 3.64 € | 4.12 € | 5.99 € | 7.77 € | 7.97 € | 3.73 € |
| Depreciation Share of Operating Cost | 86.8% | 20.88% | 21.99% | 24.62% | 19.82% | 24.58% | 23.32% | 27.31% | 31.81% | 24.33% | 11.17% |
| Labour Cost per WLU | -80.0% | 2.72 € | 2.93 € | 3.55 € | 3.24 € | 3.44 € | 3.95 € | 5.03 € | 5.63 € | 8.70 € | 13.58 € |
| Average Labour Cost per Employee | 14.2% | 49,209 € | 46,116 € | 44,090 € | 32,753 € | 30,027 € | 29,862 € | 32,007 € | 30,020 € | 34,575 € | 43,095 € |
| Labour Share of Operating Cost | -41.3% | 27.85% | 29.83% | 29.27% | 23.70% | 23.22% | 23.12% | 24.30% | 24.87% | 29.56% | 47.45% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 470.1% | 18,088 | 15,731 | 12,417 | 10,106 | 8,735 | 7,555 | 6,369 | 5,331 | 3,975 | 3,173 |
| Total Revenue per Employee | 477.3% | 226,697 € | 196,226 € | 161,233 € | 138,428 € | 109,215 € | 97,649 € | 85,596 € | 65,119 € | 49,327 € | 39,268 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | 421.9% | 10 | 9 | 8 | 8 | 8 | 6 | 5 | 4 | 3 | 2 |
| Total Asset Turnover (Total Revenue / Total Assets) | 428.5% | 0.121 | 0.115 | 0.099 | 0.108 | 0.090 | 0.076 | 0.061 | 0.045 | 0.035 | 0.023 |
| Annual Growth Total Asset Turnover | | 5.32% | 16.17% | -8.37% | 19.92% | 18.38% | 23.92% | 34.66% | 31.44% | 51.40% | base year |

## STN – Stansted, UK

## Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 1.3% | 12.53 € | 12.47 € | 12.99 € | 13.70 € | 12.50 € | 12.92 € | 13.44 € | 12.22 € | 12.41 € | 12.38 € |
| Inflation-Adjusted Total Revenue per WLU | -21.6% | 11.31 € | 11.43 € | 12.27 € | 13.38 € | 12.50 € | 13.34 € | 14.26 € | 13.18 € | 13.81 € | 14.43 € |
| Aeronautical Revenue per WLU | 28.0% | 5.17 € | 4.32 € | 4.21 € | 3.69 € | 3.21 € | 3.27 € | 3.14 € | 3.20 € | 3.48 € | 4.04 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -0.9% | 4.66 € | 3.96 € | 3.98 € | 3.60 € | 3.21 € | 3.38 € | 3.34 € | 3.45 € | 3.87 € | 4.71 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 17.68% | -0.46% | 10.50% | 12.20% | -4.93% | 1.23% | -3.23% | -10.92% | -17.77% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 175.2% | 387 € | 305 € | 281 € | 236 € | 193 € | 182 € | 171 € | 159 € | 143 € | 141 € |
| Aeronautical Revenue per Air Transport Movement | 60.1% | 439 € | 361 € | 350 € | 289 € | 242 € | 236 € | 224 € | 218 € | 202 € | 274 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -12.8% | 58.76% | 65.34% | 67.55% | 73.07% | 74.32% | 74.69% | 76.60% | 73.84% | 71.97% | 67.37% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -10.07% | -3.28% | -7.54% | -1.69% | -0.49% | -2.50% | 3.75% | 2.60% | 6.82% | base year |
| Commercial Revenue per Terminal Passenger | -12.9% | 8.50 € | 10.19 € | 10.89 € | 12.26 € | 11.49 € | 12.34 € | 13.00 € | 11.15 € | 10.34 € | 9.76 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -32.6% | 7.67 € | 9.34 € | 10.29 € | 11.98 € | 11.49 € | 12.74 € | 13.79 € | 12.03 € | 11.51 € | 11.37 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | -32.6% | 1.187 | 1.118 | 0.966 | 0.782 | 0.669 | 0.657 | 0.578 | 0.446 | 0.439 | 1.763 |
| Annual Growth RevEx | | 6.17% | 15.79% | 23.46% | 16.95% | 1.84% | 13.71% | 29.47% | 1.71% | -75.11% | base year |
| Net Income per WLU | -63.1% | 1.98 € | 1.32 € | -0.46 € | -3.81 € | -6.19 € | -6.75 € | -9.83 € | -15.16 € | -15.88 € | 5.35 € |
| Return on Total Assets (ROA) | 92.7% | 1.90% | 1.21% | -0.35% | -3.00% | -4.44% | -3.96% | -4.48% | -5.64% | -4.43% | 0.99% |
| Operating Profit per WLU | 117.0% | 2.77 € | 2.65 € | 0.86 € | 0.02 € | -2.30 € | -4.17 € | -7.24 € | -10.43 € | -17.01 € | -16.25 € |
| Inflation-Adjusted Operating Profit per WLU | 113.2% | 2.50 € | 2.43 € | 0.81 € | 0.02 € | -2.30 € | -4.31 € | -7.69 € | -11.25 € | -18.93 € | -18.94 € |
| Return on Capital Employed (ROCE) | 188.8% | 2.66% | 2.43% | 0.65% | 0.02% | -1.65% | -2.45% | -3.30% | -3.88% | -4.74% | -3.00% |
| Annual Growth ROCE | | 9.56% | 274.16% | 3955.31% | 100.97% | 32.60% | 25.76% | 14.97% | 18.16% | -58.11% | base year |

## VIE – Vienna, Austria

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -13.3% | 21.23 € | 22.85 € | 23.58 € | 26.23 € | 25.89 € | 25.76 € | 25.45 € | 24.53 € | 24.60 € | 24.48 € |
| Inflation-Adjusted Total Cost per WLU | -29.1% | 20.33 € | 22.02 € | 22.94 € | 25.84 € | 25.89 € | 26.34 € | 26.79 € | 26.75 € | 27.92 € | 28.70 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -7.64% | -4.01% | -11.24% | -0.21% | -1.69% | -1.66% | 0.12% | -4.19% | -2.70% | base year |
| Operating Cost per WLU | -20.2% | 18.95 € | 21.67 € | 22.55 € | 25.31 € | 24.73 € | 24.94 € | 26.66 € | 23.46 € | 23.89 € | 23.75 € |
| Inflation-Adjusted Operating Cost per WLU | -34.8% | 18.15 € | 20.87 € | 21.94 € | 24.94 € | 24.73 € | 25.50 € | 28.06 € | 25.58 € | 27.12 € | 27.84 € |
| Depreciation Cost per WLU | 18.2% | 3.89 € | 3.96 € | 4.34 € | 4.80 € | 4.50 € | 4.67 € | 4.61 € | 3.75 € | 3.50 € | 3.29 € |
| Inflation-Adjusted Depreciation Cost per WLU | -3.5% | 3.72 € | 3.81 € | 4.23 € | 4.73 € | 4.50 € | 4.77 € | 4.86 € | 4.09 € | 3.97 € | 3.86 € |
| Depreciation Share of Operating Cost | 48.1% | 20.51% | 18.26% | 19.26% | 18.96% | 18.19% | 18.71% | 17.30% | 16.01% | 14.63% | 13.85% |
| Labour Cost per WLU | -11.2% | 10.84 € | 10.48 € | 10.94 € | 11.98 € | 12.27 € | 11.77 € | 12.52 € | 11.39 € | 12.58 € | 12.20 € |
| Average Labour Cost per Employee | 22.6% | 52,082 € | 49,979 € | 48,857 € | 49,674 € | 51,819 € | 47,353 € | 48,758 € | 43,911 € | 43,224 € | 42,484 € |
| Labour Share of Operating Cost | 11.3% | 57.19% | 48.36% | 48.50% | 47.34% | 49.59% | 47.18% | 46.98% | 48.57% | 52.63% | 51.37% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 38.0% | 4,806 | 4,770 | 4,467 | 4,146 | 4,225 | 4,025 | 3,893 | 3,854 | 3,437 | 3,482 |
| Total Revenue per Employee | 36.3% | 123,849 € | 129,939 € | 123,834 € | 127,433 € | 132,414 € | 123,538 € | 118,758 € | 111,053 € | 97,575 € | 90,885 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -17.8% | 16 | 16 | 16 | 14 | 13 | 14 | 13 | 14 | 18 | 19 |
| Total Asset Turnover (Total Revenue / Total Assets) | -18.8% | 0.412 | 0.438 | 0.432 | 0.417 | 0.408 | 0.420 | 0.405 | 0.411 | 0.517 | 0.508 |
| Annual Growth Total Asset Turnover | | -5.94% | 1.40% | 3.56% | 2.31% | -2.74% | 3.59% | -1.46% | -20.49% | 1.74% | base year |

## VIE – Vienna, Austria

### Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | -1.3% | 25.77 € | 27.24 € | 27.72 € | 30.74 € | 31.34 € | 30.69 € | 30.50 € | 28.82 € | 28.39 € | 26.10 € |
| Inflation-Adjusted Total Revenue per WLU | -19.3% | 24.69 € | 26.24 € | 26.97 € | 30.28 € | 31.34 € | 31.38 € | 32.11 € | 31.43 € | 32.23 € | 30.60 € |
| Aeronautical Revenue per WLU | 1.4% | 18.21 € | 19.24 € | 19.61 € | 20.71 € | 21.62 € | 20.53 € | 21.16 € | 19.72 € | 19.51 € | 17.96 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -17.1% | 17.45 € | 18.53 € | 19.07 € | 20.40 € | 21.62 € | 20.99 € | 22.27 € | 21.50 € | 22.15 € | 21.05 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | -5.87% | -2.82% | -6.52% | -5.62% | 2.99% | -5.76% | 3.56% | -2.90% | 5.22% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 17.3% | 1,170 € | 1,189 € | 1,171 € | 1,160 € | 1,214 € | 1,131 € | 1,151 € | 1,057 € | 986 € | 998 € |
| Aeronautical Revenue per Air Transport Movement | -4.0% | 1,319 € | 1,368 € | 1,349 € | 1,338 € | 1,412 € | 1,358 € | 1,409 € | 1,366 € | 1,345 € | 1,375 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -6.0% | 29.33% | 29.38% | 29.28% | 32.63% | 31.03% | 33.13% | 30.64% | 31.57% | 31.27% | 31.20% |
| Annual Growth Non-Aeron. Share of Total Revenue | | -0.19% | 0.33% | -10.25% | 5.15% | -6.33% | 8.11% | -2.95% | 0.95% | 0.22% | base year |
| Commercial Revenue per Terminal Passenger | 5.1% | 7.97 € | 8.53 € | 8.61 € | 10.08 € | 9.94 € | 10.14 € | 9.07 € | 8.42 € | 8.46 € | 7.58 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -14.1% | 7.63 € | 8.22 € | 8.38 € | 9.93 € | 9.94 € | 10.37 € | 9.55 € | 9.19 € | 9.60 € | 8.89 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 13.9% | 1.214 | 1.192 | 1.176 | 1.172 | 1.210 | 1.191 | 1.199 | 1.175 | 1.154 | 1.066 |
| Annual Growth RevEx | | 1.84% | 1.38% | 0.34% | -3.18% | 1.58% | -0.60% | 2.05% | 1.79% | 8.24% | base year |
| Net Income per WLU | 180.4% | 4.54 € | 4.39 € | 4.15 € | 4.51 € | 5.45 € | 4.93 € | 5.06 € | 4.28 € | 3.79 € | 1.62 € |
| Return on Total Assets (ROA) | 130.5% | 7.27% | 7.06% | 6.47% | 6.12% | 7.09% | 6.74% | 6.71% | 6.11% | 6.90% | 3.15% |
| Operating Profit per WLU | 190.1% | 6.82 € | 5.58 € | 5.17 € | 5.43 € | 6.61 € | 5.76 € | 3.85 € | 5.36 € | 4.50 € | 2.35 € |
| Inflation-Adjusted Operating Profit per WLU | 137.1% | 6.53 € | 5.37 € | 5.03 € | 5.35 € | 6.61 € | 5.89 € | 4.05 € | 5.84 € | 5.10 € | 2.76 € |
| Return on Capital Employed (ROCE) | 138.5% | 10.91% | 8.97% | 8.06% | 7.37% | 8.60% | 7.87% | 5.11% | 7.64% | 8.19% | 4.58% |
| Annual Growth ROCE | | 21.65% | 11.25% | 9.42% | -14.33% | 9.33% | 54.06% | -33.16% | -6.64% | 78.83% | base year |

## ZRH – Zurich, Switzerland

### Partial Factor Productivity (PFP)

| Group 1: Cost Efficiency | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost per WLU | -4.2% | 8.22 € | 8.36 € | 9.16 € | 10.26 € | 10.35 € | 9.92 € | 9.72 € | 9.12 € | 9.21 € | 8.58 € |
| Inflation-Adjusted Total Cost per WLU | -19.7% | 8.05 € | 8.24 € | 9.05 € | 10.18 € | 10.35 € | 10.10 € | 9.98 € | 9.67 € | 10.17 € | 10.03 € |
| Annual Growth Inflation-Adj. Total Cost per WLU | | -2.37% | -8.89% | -11.10% | -1.70% | 2.49% | 1.21% | 3.22% | -4.92% | 1.41% | base year |
| Operating Cost per WLU | 0.9% | 7.99 € | 8.05 € | 8.81 € | 9.60 € | 9.68 € | 9.25 € | 8.99 € | 8.42 € | 8.44 € | 7.91 € |
| Inflation-Adjusted Operating Cost per WLU | -15.5% | 7.82 € | 7.94 € | 8.70 € | 9.53 € | 9.68 € | 9.42 € | 9.23 € | 8.93 € | 9.31 € | 9.25 € |
| Depreciation Cost per WLU | -18.7% | 0.99 € | 1.17 € | 1.68 € | 1.41 € | 1.33 € | 1.04 € | 0.84 € | 0.94 € | 0.82 € | 1.22 € |
| Inflation-Adjusted Depreciation Cost per WLU | -31.9% | 0.97 € | 1.15 € | 1.66 € | 1.40 € | 1.33 € | 1.06 € | 0.86 € | 0.99 € | 0.90 € | 1.43 € |
| Depreciation Share of Operating Cost | -19.4% | 12.42% | 14.48% | 19.09% | 14.64% | 13.77% | 11.28% | 9.37% | 11.13% | 9.68% | 15.42% |
| Labour Cost per WLU | -3.9% | 1.61 € | 1.63 € | 1.71 € | 2.04 € | 2.03 € | 2.03 € | 2.05 € | 1.94 € | 1.96 € | 1.67 € |
| Average Labour Cost per Employee | 33.9% | 64,842 € | 60,788 € | 60,233 € | 64,089 € | 61,691 € | 59,504 € | 56,823 € | 52,848 € | 51,522 € | 48,435 € |
| Labour Share of Operating Cost | -4.8% | 20.10% | 20.21% | 19.41% | 21.25% | 20.98% | 21.97% | 22.85% | 23.00% | 23.22% | 21.11% |
| **Group 2: Labour Productivity** | | | | | | | | | | | |
| WLU per Employee | 39.3% | 40,392 | 37,370 | 35,202 | 31,398 | 30,387 | 29,288 | 27,672 | 27,291 | 26,304 | 28,992 |
| Total Revenue per Employee | 54.1% | 396,063 € | 359,813 € | 367,526 € | 343,196 € | 328,874 € | 302,283 € | 270,989 € | 251,791 € | 240,749 € | 257,067 € |
| **Group 3: Capital Productivity** | | | | | | | | | | | |
| Asset Utilization (WLU / Total Assets in '000) | -3.4% | 104 | 109 | 104 | 91 | 86 | 91 | 93 | 101 | 95 | 108 |
| Total Asset Turnover (Total Revenue / Total Assets) | 6.9% | 1.025 | 1.051 | 1.082 | 0.995 | 0.933 | 0.942 | 0.910 | 0.934 | 0.872 | 0.959 |
| Annual Growth Total Asset Turnover | | -2.47% | -2.87% | 8.67% | 6.70% | -0.99% | 3.55% | -2.57% | 7.06% | -9.03% | base year |

## ZRH – Zurich, Switzerland

## Partial Factor Productivity (PFP) cont'd

| Group 4: Revenue Generation | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenue per WLU | 10.6% | 9.81 € | 9.63 € | 10.44 € | 10.93 € | 10.82 € | 10.32 € | 9.79 € | 9.23 € | 9.15 € | 8.87 € |
| Inflation-Adjusted Total Revenue per WLU | -7.4% | 9.59 € | 9.50 € | 10.31 € | 10.84 € | 10.82 € | 10.51 € | 10.05 € | 9.78 € | 10.10 € | 10.36 € |
| Aeronautical Revenue per WLU | 10.8% | 6.43 € | 6.35 € | 7.05 € | 7.14 € | 6.98 € | 6.55 € | 6.04 € | 5.75 € | 5.82 € | 5.80 € |
| Inflation-Adjusted Aeronautical Revenue per WLU | -7.2% | 6.29 € | 6.27 € | 6.96 € | 7.09 € | 6.98 € | 6.67 € | 6.20 € | 6.09 € | 6.43 € | 6.77 € |
| Annual Growth Infl.-Adj. Aeron. Revenue per WLU | | 0.32% | -9.97% | -1.76% | 1.47% | 4.73% | 7.48% | 1.83% | -5.18% | -5.14% | base year |
| Aeronautical Revenue per Total Aircraft Movement | 25.5% | 514 € | 496 € | 548 € | 533 € | 526 € | 472 € | 420 € | 386 € | 382 € | 409 € |
| Aeronautical Revenue per Air Transport Movement | 11.3% | 582 € | 568 € | 627 € | 613 € | 615 € | 561 € | 499 € | 470 € | 483 € | 523 € |
| **Group 5: Commercial Performance** | | | | | | | | | | | |
| Non-Aeronautical Share of Total Revenue | -0.4% | 34.47% | 34.00% | 32.46% | 34.65% | 35.48% | 36.56% | 38.30% | 37.73% | 36.40% | 34.61% |
| Annual Growth Non-Aeron. Share of Total Revenue | | 1.39% | 4.75% | -6.34% | -2.32% | -2.96% | -4.54% | 1.51% | 3.66% | 5.17% | base year |
| Commercial Revenue per Terminal Passenger | 3.9% | 3.68 € | 3.65 € | 3.83 € | 4.36 € | 4.50 € | 4.41 € | 4.37 € | 4.06 € | 3.87 € | 3.54 € |
| Infl.-Adj. Commercial Revenue per Terminal PAX | -13.0% | 3.60 € | 3.60 € | 3.78 € | 4.33 € | 4.50 € | 4.49 € | 4.49 € | 4.30 € | 4.27 € | 4.14 € |
| **Group 6: Profitability** | | | | | | | | | | | |
| Revenue / Expenditure Ratio (RevEx) | 15.4% | 1.192 | 1.152 | 1.139 | 1.066 | 1.046 | 1.041 | 1.008 | 1.012 | 0.994 | 1.033 |
| Annual Growth RevEx | | 3.50% | 1.12% | 6.92% | 1.92% | 0.47% | 3.28% | -0.44% | 1.86% | -3.83% | base year |
| Net Income per WLU | 455.6% | 1.58 € | 1.27 € | 1.28 € | 0.67 € | 0.47 € | 0.40 € | 0.07 € | 0.11 € | -0.06 € | 0.28 € |
| Return on Total Assets (ROA) | 437.0% | 16.53% | 13.87% | 13.23% | 6.13% | 4.06% | 3.68% | 0.69% | 1.11% | -0.56% | 3.08% |
| Operating Profit per WLU | 90.9% | 1.82 € | 1.58 € | 1.63 € | 1.33 € | 1.15 € | 1.07 € | 0.80 € | 0.81 € | 0.72 € | 0.95 € |
| Inflation-Adjusted Operating Profit per WLU | 59.9% | 1.78 € | 1.56 € | 1.61 € | 1.32 € | 1.15 € | 1.09 € | 0.83 € | 0.86 € | 0.79 € | 1.11 € |
| Return on Capital Employed (ROCE) | 84.4% | 18.98% | 17.24% | 16.86% | 12.08% | 9.88% | 9.78% | 7.47% | 8.18% | 6.82% | 10.29% |
| Annual Growth ROCE | | 10.09% | 2.30% | 39.59% | 22.16% | 1.04% | 30.93% | -8.67% | 19.96% | -33.74% | base year |

## Appendix B.4: Results of Financial Ratio Analysis

### ABZ – Aberdeen, UK

### Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 36.8% | 36.17% | 36.21% | 37.99% | 34.57% | 29.72% | 28.13% | 30.90% | 32.00% | 24.60% | 26.43% |
| Annual Growth Operating Margin | | | -0.11% | -4.68% | 9.88% | 16.32% | 5.65% | -8.94% | -3.45% | 30.05% | -6.92% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 40.9% | 42.84% | 42.80% | 44.58% | 40.89% | 35.37% | 33.15% | 35.14% | 36.20% | 29.92% | 30.40% |
| Annual Growth EBITDA Margin | | | 0.10% | -3.99% | 9.01% | 15.60% | 6.69% | -5.64% | -2.94% | 21.00% | -1.57% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 56.4% | 15.20% | 18.01% | 18.81% | 17.35% | 13.44% | 12.32% | 13.89% | 13.69% | 9.25% | 9.72% |
| Annual Growth RONA b.I.a.T. | | | -15.64% | -4.21% | 8.39% | 29.07% | 9.10% | -11.30% | 1.49% | 48.03% | -4.85% | base year |
| EBITDA per WLU | EBITDA / WLUs | 83.3% | 7.01 € | 6.47 € | 6.63 € | 5.63 € | 4.49 € | 4.37 € | 4.57 € | 4.38 € | 3.75 € | 3.82 € |
| Inflation-Adjusted EBITDA per WLU | | 41.9% | 6.32 € | 5.93 € | 6.27 € | 5.50 € | 4.49 € | 4.51 € | 4.85 € | 4.73 € | 4.18 € | 4.46 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 38.7% | 26.49% | 25.31% | 23.10% | 22.30% | 19.76% | 19.31% | 22.34% | 23.08% | 18.26% | 19.09% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 58.6% | 11.13% | 12.59% | 11.43% | 11.19% | 8.94% | 8.46% | 10.05% | 9.87% | 6.86% | 7.02% |
| Annual Growth ROE (Shareh. Funds) | | | -11.60% | 10.12% | 2.15% | 25.23% | 5.68% | -15.80% | 1.75% | 43.87% | -2.25% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 55.2% | 13.74% | 20.93% | 18.93% | 22.99% | 25.97% | 21.21% | 13.60% | 10.60% | 9.59% | 8.85% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 64.0% | 15.93% | 26.47% | 23.34% | 29.85% | 35.08% | 26.91% | 15.74% | 11.85% | 10.60% | 9.71% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 6.0% | 0.397 | 0.426 | 0.430 | 0.411 | 0.354 | 0.364 | 0.411 | 0.411 | 0.372 | 0.374 |

## ABZ – Aberdeen, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -5.4% | 86.26% | 79.07% | 81.07% | 77.01% | 74.03% | 78.79% | 86.40% | 89.40% | 90.41% | 91.15% |
| Financial Leverage | Total Assets / Shareh. Funds | 5.7% | 115.93% | 126.47% | 123.34% | 129.85% | 135.08% | 126.91% | 115.74% | 111.85% | 110.60% | 109.71% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 128.2% | 13,585 € | 12,980 € | 11,888 € | 9,850 € | 7,574 € | 7,163 € | 8,127 € | 7,433 € | 6,349 € | 5,954 € |
| Annual Growth Cash Flow | | | 4.66% | 9.19% | 20.69% | 30.04% | 5.74% | -11.87% | 9.34% | 17.07% | 6.64% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 87.1% | 5.43 € | 4.83 € | 4.42 € | 3.94 € | 3.23 € | 3.21 € | 3.46 € | 3.30 € | 2.96 € | 2.90 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 43.8% | 33.16% | 31.90% | 29.68% | 28.62% | 25.41% | 24.33% | 26.58% | 27.28% | 23.57% | 23.06% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -39.9% | 2.908 | 2.393 | 3.101 | 1.925 | 1.118 | 0.788 | 1.614 | 2.477 | 2.116 | 4.836 |
| Tax Rate | Taxes Paid / EBT | -24.9% | 27.11% | 29.09% | 25.38% | 30.23% | 28.14% | 29.44% | 32.01% | 31.16% | 31.85% | 36.12% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 14.3% | 0.420 | 0.497 | 0.495 | 0.502 | 0.452 | 0.438 | 0.450 | 0.428 | 0.376 | 0.368 |
| Owner Earnings (in '000) | Cash Flow – Investment | Σ 90-99 43,720 € | 8,913 € | 7,555 € | 8,054 € | 4,733 € | 797 € | -1,927 € | 3,091 € | 4,432 € | 3,348 € | 4,723 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 206.1% | 1.91 € | 2.07 € | 1.47 € | 2.12 € | 2.99 € | 4.21 € | 2.22 € | 1.38 € | 1.45 € | 0.62 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 136.9% | 1.72 € | 1.89 € | 1.39 € | 2.07 € | 2.99 € | 4.35 € | 2.35 € | 1.48 € | 1.61 € | 0.73 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 139.2% | 11.40% | 13.33% | 9.57% | 14.87% | 22.74% | 30.88% | 16.48% | 11.02% | 11.14% | 4.77% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 42.1% | 1.709 | 2.023 | 1.453 | 2.353 | 4.025 | 6.150 | 3.883 | 2.621 | 2.096 | 1.203 |

## ADP – Aeroports de Paris Group, France — Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 13.4% | 20.56% | 19.75% | 17.85% | 18.03% | 19.10% | 18.14% | 18.12% | 21.50% | 19.18% | 18.13% |
| Annual Growth Operating Margin | | | 4.07% | 10.65% | -1.00% | -5.60% | 5.29% | 0.11% | -15.71% | 12.08% | 5.81% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 14.9% | 35.26% | 34.13% | 32.83% | 32.09% | 31.53% | 31.92% | 30.67% | 32.98% | 31.77% | 30.69% |
| Annual Growth EBITDA Margin | | | 3.31% | 3.96% | 2.29% | 1.78% | -1.23% | 4.08% | -6.99% | 3.82% | 3.50% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -10.5% | 21.76% | 20.87% | 18.68% | 19.55% | 21.45% | 20.89% | 22.22% | 28.00% | 24.93% | 24.31% |
| Annual Growth RONA b.I.a.T. | | | 4.27% | 11.73% | -4.43% | -8.87% | 2.67% | -5.98% | -20.66% | 12.35% | 2.55% | base year |
| EBITDA per WLU | EBITDA / WLUs | 43.0% | 5.92 € | 5.64 € | 5.18 € | 5.20 € | 5.29 € | 5.02 € | 4.88 € | 5.14 € | 4.69 € | 4.14 € |
| Inflation-Adjusted EBITDA per WLU | | 22.5% | 5.66 € | 5.43 € | 5.02 € | 5.10 € | 5.29 € | 5.10 € | 5.05 € | 5.43 € | 5.07 € | 4.62 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | -2.8% | 7.55% | 6.30% | 5.39% | 5.46% | 4.75% | 6.87% | 5.45% | 8.72% | 6.85% | 7.77% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -23.3% | 8.00% | 6.66% | 5.64% | 5.92% | 5.34% | 7.91% | 6.68% | 11.36% | 8.90% | 10.42% |
| Annual Growth ROE (Shareh. Funds) | | | 20.14% | 17.97% | -4.67% | 10.86% | -32.51% | 18.49% | -41.20% | 27.60% | -14.61% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 0.1% | 60.02% | 60.73% | 60.13% | 60.64% | 61.98% | 61.53% | 63.65% | 65.02% | 59.76% | 59.97% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 0.2% | 150.10% | 154.62% | 150.80% | 154.06% | 163.00% | 159.94% | 175.07% | 185.90% | 148.49% | 149.79% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -30.2% | 0.483 | 0.474 | 0.485 | 0.511 | 0.527 | 0.539 | 0.549 | 0.581 | 0.631 | 0.692 |

## ADP – Aeroports de Paris Group, France

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -0.1% | 39.98% | 39.27% | 39.87% | 39.36% | 38.02% | 38.47% | 36.35% | 34.98% | 40.24% | 40.03% |
| Financial Leverage | Total Assets / Shareh. Funds | 0.1% | 250.10% | 254.62% | 250.80% | 254.06% | 263.00% | 259.94% | 275.07% | 285.90% | 248.49% | 249.79% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 99.6% | 307,994 € | 260,894 € | 235,712 € | 225,416 € | 192,718 € | 217,118 € | 175,987 € | 187,388 € | 155,089 € | 154,320€ |
| Annual Growth Cash Flow | | | 18.05% | 10.68% | 4.57% | 16.97% | -11.24% | 23.37% | -6.08% | 20.83% | 0.50% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 36.2% | 3.74 € | 3.42 € | 3.22 € | 3.16 € | 2.88 € | 3.24 € | 2.86 € | 3.15 € | 2.87 € | 2.74 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 9.4% | 22.26% | 20.68% | 20.37% | 19.52% | 17.19% | 20.65% | 18.00% | 20.20% | 19.43% | 20.34% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 25.8% | 0.924 | 0.631 | 0.660 | 0.766 | 0.678 | 0.846 | 0.684 | 0.437 | 0.601 | 0.734 |
| Tax Rate | Taxes Paid / EBT | 18.1% | 42.36% | 43.84% | 54.26% | 33.59% | 37.14% | 32.69% | 31.07% | 42.27% | 36.42% | 35.85% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -21.0% | 1.059 | 1.057 | 1.046 | 1.084 | 1.123 | 1.152 | 1.226 | 1.303 | 1.299 | 1.341 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -980,995 € | -25,412 € | -152,453 € | -121,614 € | -69,040 € | -91,491 € | -39,545 € | -81,133 € | -241,598 € | -102,835 € | -55,875 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 8.1% | 4.84 € | 6.51 € | 5.94 € | 5.00 € | 5.20 € | 4.67 € | 5.04 € | 8.60 € | 5.75 € | 4.48 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -7.4% | 4.63 € | 6.26 € | 5.75 € | 4.91 € | 5.20 € | 4.75 € | 5.21 € | 9.08 € | 6.21 € | 5.00 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -13.0% | 24.09% | 32.76% | 30.88% | 25.50% | 25.34% | 24.42% | 26.30% | 46.24% | 32.32% | 27.70% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -25.7% | 1.638 | 2.278 | 2.062 | 1.813 | 2.039 | 1.771 | 2.095 | 4.028 | 2.568 | 2.205 |

## ADR – Aeroporti di Roma, Italy

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 368.5% | 15.30% | 17.78% | 16.47% | 16.61% | 14.01% | 10.70% | 5.40% | 2.30% | 3.69% | 3.26% |
| Annual Growth Operating Margin | | | -13.99% | 7.96% | -0.85% | 18.61% | 30.86% | 98.17% | 134.69% | -37.62% | 13.00% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 96.3% | 22.45% | 23.88% | 21.62% | 22.13% | 20.56% | 16.75% | 13.08% | 9.72% | 11.87% | 11.44% |
| Annual Growth EBITDA Margin | | | -6.00% | 10.46% | -2.32% | 7.65% | 22.74% | 28.11% | 34.53% | -18.14% | 3.82% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 76.9% | 52.59% | 65.09% | 72.75% | 98.23% | 119.82% | 106.93% | 57.85% | 28.35% | 41.18% | 29.73% |
| Annual Growth RONA b.I.a.T. | | | -19.21% | -10.53% | -25.93% | -18.02% | 12.05% | 84.84% | 104.09% | -31.17% | 38.52% | base year |
| EBITDA per WLU | EBITDA / WLUs | 119.3% | 5.18 € | 4.80 € | 4.68 € | 5.06 € | 4.28 € | 3.65 € | 2.82 € | 2.64 € | 3.29 € | 2.36 € |
| Inflation-Adjusted EBITDA per WLU | | 55.5% | 4.71 € | 4.43 € | 4.41 € | 4.86 € | 4.28 € | 3.84 € | 3.09 € | 3.02 € | 3.97 € | 3.03 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 381.3% | 6.19% | 9.87% | 7.56% | 7.64% | 5.31% | 3.44% | 2.00% | 0.79% | 0.82% | 1.29% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 81.7% | 21.29% | 36.11% | 33.41% | 45.19% | 45.40% | 34.37% | 21.40% | 9.67% | 9.12% | 11.72% |
| Annual Growth ROE (Shareh. Funds) | | | -41.05% | 8.09% | -26.08% | -0.46% | 32.10% | 60.61% | 121.20% | 6.12% | -22.19% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -20.5% | 74.70% | 74.71% | 73.95% | 80.48% | 86.90% | 87.62% | 88.47% | 95.71% | 95.30% | 93.92% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -80.9% | 295.20% | 295.34% | 283.89% | 412.22% | 663.61% | 708.06% | 767.05% | 2230.86% | 2027.62% | 1544.72% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -10.9% | 1.376 | 1.445 | 2.679 | 3.533 | 3.154 | 3.204 | 2.533 | 1.832 | 1.727 | 1.545 |

## ADR – Aeroporti di Roma, Italy

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 316.2% | 25.30% | 25.29% | 26.05% | 19.52% | 13.10% | 12.38% | 11.53% | 4.29% | 4.70% | 6.08% |
| Financial Leverage | Total Assets / Shareh. Funds | -76.0% | 395.20% | 395.34% | 383.89% | 512.22% | 763.61% | 808.06% | 867.05% | 2330.86% | 2127.62% | 1644.72% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 94.4% | 80,759 € | 91,316 € | 78,199 € | 79,866 € | 60,321 € | 48,550 € | 46,621 € | 49,268 € | 48,803 € | 41,547 € |
| Annual Growth Cash Flow | | | -11.56% | 16.77% | -2.09% | 32.40% | 24.25% | 4.14% | -5.37% | 0.95% | 17.47% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 57.6% | 3.08 € | 3.21 € | 2.75 € | 3.01 € | 2.47 € | 2.07 € | 2.09 € | 2.22 € | 2.49 € | 1.95 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 41.1% | 13.35% | 15.96% | 12.71% | 13.16% | 11.86% | 9.49% | 9.67% | 8.20% | 9.00% | 9.46% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 116.7% | 1.108 | 0.444 | 1.148 | 2.423 | 1.893 | 1.429 | 1.085 | 0.982 | 0.823 | 0.512 |
| Tax Rate | Taxes Paid / EBT | -19.7% | 43.74% | 48.26% | 56.58% | 59.29% | 63.66% | 55.30% | 53.84% | 32.78% | 59.80% | 54.46% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -62.2% | 3.438 | 3.660 | 4.416 | 5.912 | 8.554 | 9.989 | 10.710 | 12.316 | 11.161 | 9.105 |
| Owner Earnings (in '000) | Cash Flow - Investment | ∑ 90-99 -53,732 € | 7,886 € | -114,295 € | 10,110 € | 46,910 € | 28,458 € | 14,576 € | 3,643 € | -880 € | -10,463 € | -39,676 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -32.0% | 3.01 € | 7.99 € | 2.67 € | 1.40 € | 1.49 € | 1.66 € | 2.22 € | 2.60 € | 3.54 € | 4.42 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -51.8% | 2.73 € | 7.38 € | 2.52 € | 1.35 € | 1.49 € | 1.75 € | 2.44 € | 2.98 € | 4.27 € | 5.67 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -34.9% | 12.04% | 35.94% | 11.07% | 5.43% | 6.26% | 6.64% | 8.92% | 8.35% | 10.93% | 18.49% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -25.6% | 1.684 | 5.895 | 2.150 | 0.984 | 0.956 | 1.098 | 1.162 | 1.126 | 1.336 | 2.263 |

## AMS – Schiphol Group (Amsterdam), Netherlands — Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 111.5% | 30.33% | 28.61% | 25.77% | 25.38% | 23.74% | 19.81% | 19.41% | 18.75% | 15.14% | 14.34% |
| Annual Growth Operating Margin | | | 6.02% | 11.01% | 1.52% | 6.91% | 19.84% | 2.06% | 3.53% | 23.83% | 5.60% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 26.8% | 43.67% | 46.22% | 44.36% | 45.01% | 44.66% | 42.27% | 37.79% | 39.44% | 35.78% | 34.45% |
| Annual Growth EBITDA Margin | | | -5.51% | 4.17% | -1.43% | 0.78% | 5.63% | 11.88% | -4.18% | 10.23% | 3.84% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 89.1% | 13.07% | 13.61% | 12.65% | 12.17% | 11.17% | 10.14% | 10.36% | 9.54% | 7.25% | 6.91% |
| Annual Growth RONA b.I.a.T. | | | -4.01% | 7.58% | 3.94% | 9.03% | 10.14% | -2.17% | 8.62% | 31.52% | 4.99% | base year |
| EBITDA per WLU | EBITDA / WLUs | 27.5% | 5.17 € | 5.39 € | 5.08 € | 5.31 € | 5.25 € | 5.43 € | 5.09 € | 4.97 € | 4.44 € | 4.05 € |
| Inflation-Adjusted EBITDA per WLU | | 2.6% | 4.76 € | 5.07 € | 4.88 € | 5.21 € | 5.25 € | 5.53 € | 5.34 € | 5.34 € | 4.92 € | 4.64 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 145.9% | 21.66% | 24.47% | 22.22% | 17.73% | 16.49% | 13.25% | 11.33% | 11.88% | 8.83% | 8.81% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 119.8% | 9.33% | 11.64% | 10.91% | 8.50% | 7.76% | 6.78% | 6.05% | 6.05% | 4.23% | 4.25% |
| Annual Growth ROE (Shareh. Funds) | | | -19.84% | 6.69% | 28.34% | 9.64% | 14.40% | 12.07% | 0.08% | 42.84% | -0.34% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 16.2% | 38.33% | 39.94% | 40.28% | 41.17% | 42.01% | 44.51% | 45.87% | 41.36% | 38.00% | 33.00% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 26.2% | 62.16% | 66.49% | 67.44% | 69.97% | 72.43% | 80.22% | 84.73% | 70.54% | 61.30% | 49.26% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -15.9% | 0.288 | 0.329 | 0.338 | 0.328 | 0.302 | 0.321 | 0.326 | 0.315 | 0.311 | 0.343 |

## AMS – Schiphol Group (Amsterdam), Netherlands — Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -8.0% | 61.67% | 60.06% | 59.72% | 58.83% | 57.99% | 55.49% | 54.13% | 58.64% | 62.00% | 67.00% |
| Financial Leverage | Total Assets / Shareh. Funds | 8.6% | 162.16% | 166.49% | 167.44% | 169.97% | 172.43% | 180.22% | 184.73% | 170.54% | 161.30% | 149.26% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 164.7% | 205,450 € | 230,752 € | 203,896 € | 171,906 € | 156,435 € | 147,590 € | 116,883 € | 107,952 € | 84,274 € | 77,606 € |
| Annual Growth Cash Flow | | | -10.97% | 13.17% | 18.61% | 9.89% | 5.99% | 26.27% | 8.27% | 28.10% | 8.59% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 21.7% | 4.14 € | 4.91 € | 4.67 € | 4.41 € | 4.40 € | 4.59 € | 4.00 € | 4.10 € | 3.66 € | 3.40 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 21.0% | 35.00% | 42.08% | 40.82% | 37.35% | 37.41% | 35.71% | 29.71% | 32.57% | 29.47% | 28.93% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -0.7% | 0.612 | 0.891 | 0.937 | 1.404 | 0.946 | 0.987 | 0.728 | 0.586 | 0.481 | 0.616 |
| Tax Rate | Taxes Paid / EBT | 241.2% | 0.21% | 0.18% | 3.26% | 0.01% | 0.00% | 1.26% | 0.00% | -0.13% | -0.18% | -0.15% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -10.6% | 0.431 | 0.476 | 0.491 | 0.480 | 0.470 | 0.512 | 0.534 | 0.509 | 0.479 | 0.482 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -392,973 € | -130,428 € | -28,332 € | -13,610 € | 49,490 € | -8,876 € | -1,965 € | -43,774 € | -76,113 € | -90,939 € | -48,424 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 17.6% | 8.99 € | 7.44 € | 6.90 € | 4.41 € | 6.54 € | 6.40 € | 7.62 € | 9.67 € | 10.64 € | 7.65 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -5.4% | 8.28 € | 7.00 € | 6.62 € | 4.33 € | 6.54 € | 6.52 € | 7.99 € | 10.40 € | 11.79 € | 8.75 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 21.8% | 57.23% | 47.24% | 43.55% | 26.60% | 39.53% | 36.19% | 40.84% | 55.53% | 61.27% | 46.98% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 83.7% | 4.289 | 2.683 | 2.342 | 1.355 | 1.890 | 1.611 | 2.222 | 2.684 | 2.969 | 2.335 |

## BAA Group, UK

### Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -36.0% | 18.95% | 29.40% | 31.03% | 35.76% | 35.36% | 34.60% | 33.52% | 34.03% | 27.28% | 29.62% |
| Annual Growth Operating Margin | | | -35.54% | -5.25% | -13.23% | 1.15% | 2.19% | 3.23% | -1.52% | 24.74% | -7.88% | base year |
| EBITDA Margin | EBITDA / Total Revenue | -21.1% | 28.81% | 38.74% | 39.01% | 43.77% | 43.34% | 42.36% | 41.17% | 42.75% | 35.78% | 36.52% |
| Annual Growth EBITDA Margin | | | -25.65% | -0.68% | -10.88% | 1.01% | 2.29% | 2.91% | -3.71% | 19.50% | -2.05% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -32.4% | 8.90% | 13.60% | 13.93% | 14.19% | 13.99% | 14.09% | 14.47% | 15.83% | 13.19% | 13.17% |
| Annual Growth RONA b.I.a.T. | | | -34.58% | -2.37% | -1.78% | 1.42% | -0.76% | -2.60% | -8.57% | 19.99% | 0.19% | base year |
| EBITDA per WLU | EBITDA / WLUs | 32.6% | 6.92 € | 8.45 € | 7.90 € | 6.72 € | 5.94 € | 6.05 € | 6.21 € | 5.97 € | 5.58 € | 5.22 € |
| Inflation-Adjusted EBITDA per WLU | | 2.6% | 6.24 € | 7.74 € | 7.47 € | 6.56 € | 5.94 € | 6.24 € | 6.59 € | 6.44 € | 6.21 € | 6.08 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | -46.1% | 12.21% | 20.32% | 16.50% | 21.56% | 25.14% | 24.07% | 21.86% | 22.16% | 16.94% | 22.66% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -43.1% | 5.73% | 9.40% | 7.41% | 8.55% | 9.95% | 9.81% | 9.44% | 10.31% | 8.19% | 10.07% |
| Annual Growth ROE (Shareh. Funds) | | | -39.00% | 26.88% | -13.38% | -14.01% | 1.42% | 3.91% | -8.44% | 25.84% | -18.69% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -5.4% | 37.86% | 39.61% | 41.87% | 37.03% | 35.21% | 33.37% | 33.52% | 37.80% | 39.47% | 40.01% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -8.6% | 60.93% | 65.59% | 72.02% | 58.80% | 54.34% | 50.09% | 50.41% | 60.77% | 65.21% | 66.68% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 14.7% | 0.328 | 0.303 | 0.280 | 0.277 | 0.276 | 0.283 | 0.305 | 0.313 | 0.308 | 0.286 |

## BAA Group, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 3.6% | 62.14% | 60.39% | 58.13% | 62.97% | 64.79% | 66.63% | 66.48% | 62.20% | 60.53% | 59.99% |
| Financial Leverage | Total Assets / Shareh. Funds | -3.5% | 160.93% | 165.59% | 172.02% | 158.80% | 154.34% | 150.09% | 150.41% | 160.77% | 165.21% | 166.68% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 108.8% | 728,773 € | 848,423 € | 607,157 € | 519,364 € | 495,641 € | 466,174 € | 423,225 € | 385,157 € | 328,993 € | 348,995 € |
| Annual Growth Cash Flow | | | -14.10% | 39.74% | 16.90% | 4.79% | 6.32% | 10.15% | 9.88% | 17.07% | -5.73% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 25.5% | 5.30 € | 6.47 € | 4.96 € | 4.54 € | 4.54 € | 4.54 € | 4.45 € | 4.31 € | 3.97 € | 4.22 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -25.4% | 22.07% | 29.66% | 24.48% | 29.57% | 33.12% | 31.84% | 29.51% | 30.88% | 25.43% | 29.57% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 81.3% | 1.033 | 1.198 | 0.669 | 0.883 | 0.979 | 0.839 | 1.122 | 1.673 | 1.031 | 0.570 |
| Tax Rate | Taxes Paid / EBT | 29.9% | 30.50% | 22.29% | 42.29% | 27.27% | 24.64% | 23.77% | 25.47% | 25.96% | 19.79% | 23.48% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 5.6% | 0.470 | 0.463 | 0.449 | 0.397 | 0.396 | 0.407 | 0.432 | 0.465 | 0.484 | 0.445 |
| Owner Earnings (in '000) | Cash Flow - Investment | ∑ 90-99 -357,935 € | 23,358 € | 140,187 € | -299,886 € | -69,078 € | -10,749 € | -89,445 € | 46,111 € | 154,980 € | 9,961 € | -263,374€ |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -29.8% | 5.98 € | 6.29 € | 8.67 € | 6.00 € | 5.40 € | 6.33 € | 4.60 € | 2.96 € | 4.43 € | 8.52 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -45.7% | 5.40 € | 5.76 € | 8.19 € | 5.86 € | 5.40 € | 6.53 € | 4.88 € | 3.19 € | 4.92 € | 9.94 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -58.8% | 21.36% | 24.76% | 36.57% | 33.50% | 33.84% | 37.95% | 26.29% | 18.46% | 24.66% | 51.88% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -71.1% | 2.167 | 2.650 | 4.582 | 4.182 | 4.240 | 4.887 | 3.437 | 2.117 | 2.904 | 7.512 |

## BER – Berlin Group, Germany

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 94-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 143.2% | 5.60% | -7.53% | 4.36% | -7.94% | 0.75% | -12.95% | n/a | n/a | n/a | n/a |
| Annual Growth Operating Margin | | | 174.33% | -272.58% | 154.93% | -1164.84% | 105.76% | base year | n/a | n/a | n/a | n/a |
| EBITDA Margin | EBITDA / Total Revenue | 412.0% | 23.63% | 20.43% | 23.75% | 13.17% | 17.65% | 4.62% | n/a | n/a | n/a | n/a |
| Annual Growth EBITDA Margin | | | 15.66% | -13.98% | 80.34% | -25.38% | 282.44% | base year | n/a | n/a | n/a | n/a |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 110.0% | 9.17% | -11.68% | 4.51% | -13.17% | 2.30% | -91.39% | n/a | n/a | n/a | n/a |
| Annual Growth RONA b.I.a.T. | | | 178.46% | -359.06% | 134.25% | -671.42% | 102.52% | base year | n/a | n/a | n/a | n/a |
| EBITDA per WLU | EBITDA / WLUs | 362.3% | 3.11 € | 2.76 € | 3.42 € | 1.97 € | 2.67 € | 0.67 € | n/a | n/a | n/a | n/a |
| Inflation-Adjusted EBITDA per WLU | | 333.2% | 2.97 € | 2.65 € | 3.31 € | 1.95 € | 2.67 € | 0.68 € | n/a | n/a | n/a | n/a |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 88.8% | -2.71% | -36.93% | -6.61% | -12.90% | -14.80% | -24.15% | n/a | n/a | n/a | n/a |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 97.4% | -4.44% | -57.30% | -6.84% | -21.39% | -45.74% | -170.45% | n/a | n/a | n/a | n/a |
| Annual Growth ROE (Shareh. Funds) | | | 92.24% | -738.20% | 68.04% | 53.24% | 73.17% | base year | n/a | n/a | n/a | n/a |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -14.6% | 82.54% | 81.27% | 72.43% | 84.68% | 91.86% | 96.70% | n/a | n/a | n/a | n/a |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -83.9% | 472.87% | 433.89% | 262.72% | 552.82% | 1128.17% | 2931.90% | n/a | n/a | n/a | n/a |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 18.5% | 0.364 | 0.356 | 0.368 | 0.335 | 0.328 | 0.307 | n/a | n/a | n/a | n/a |

## BER – Berlin Group, Germany

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 94-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 429.2% | 17.46% | 18.73% | 27.57% | 15.32% | 8.14% | 3.30% | n/a | n/a | n/a | n/a |
| Financial Leverage | Total Assets / Shareh. Funds | -81.1% | 572.87% | 533.89% | 362.72% | 652.82% | 1228.17% | 3031.90% | n/a | n/a | n/a | n/a |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 352.9% | 25,532 € | -14,640 € | 21,872 € | 13,894 € | 3,595 € | -10,095 € | n/a | n/a | n/a | n/a |
| Annual Growth Cash Flow | | | 274.40% | -166.94% | 57.42% | 286.50% | 135.61% | base year | n/a | n/a | n/a | n/a |
| Cash Flow per WLU | Cash Flow / WLUs | 310.1% | 2.02 € | -1.21 € | 1.84 € | 1.23 € | 0.32 € | -0.96 € | n/a | n/a | n/a | n/a |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 332.7% | 15.32% | -8.97% | 12.78% | 8.21% | 2.10% | -6.58% | n/a | n/a | n/a | n/a |
| Investment Coverage Ratio | Cash Flow / Cap. Expend. | 556.2% | 0.914 | -0.358 | 0.905 | 0.511 | 0.068 | -0.200 | n/a | n/a | n/a | n/a |
| Tax Rate | Taxes Paid / EBT | 768.8% | 34.17% | 4.05% | 21.39% | 5.18% | 7.79% | 3.93% | n/a | n/a | n/a | n/a |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -76.8% | 1.638 | 1.552 | 1.034 | 1.658 | 3.089 | 7.059 | n/a | n/a | n/a | n/a |
| Owner Earnings (in '000) | Cash Flow - Investment | ∑ 94-99 -183,280 € | -2,409 € | -55,539 € | -2,307 € | -13,321 € | -49,209 € | -60,495 € | n/a | n/a | n/a | n/a |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -54.4% | 2.28 € | 3.52 € | 2.13 € | 2.52 € | 4.88 € | 5.00 € | n/a | n/a | n/a | n/a |
| Infl.-Adj. Capital Exp. per Term. PAX | | -57.3% | 2.18 € | 3.38 € | 2.06 € | 2.49 € | 4.88 € | 5.09 € | n/a | n/a | n/a | n/a |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -49.0% | 16.77% | 25.05% | 14.12% | 16.08% | 30.86% | 32.87% | n/a | n/a | n/a | n/a |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -50.3% | 0.930 | 0.896 | 0.728 | 0.762 | 1.825 | 1.872 | n/a | n/a | n/a | n/a |

## BFS – Belfast, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 156.4% | 40.77% | 47.79% | 44.45% | 39.07% | 28.62% | 16.60% | 18.71% | 9.20% | 11.34% | 15.90% |
| Annual Growth Operating Margin | | | -14.70% | 7.53% | 13.78% | 36.50% | 72.38% | -11.27% | 103.30% | -18.85% | -28.67% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 85.6% | 43.72% | 50.65% | 48.18% | 41.24% | 33.14% | 21.68% | 23.58% | 16.02% | 18.64% | 23.55% |
| Annual Growth EBITDA Margin | | | -13.67% | 5.13% | 16.80% | 24.46% | 52.88% | -8.05% | 47.14% | -14.03% | -20.87% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 57.9% | 22.46% | 17.27% | 16.50% | 16.39% | -63.92% | -25.74% | 12.06% | 6.80% | 9.31% | 14.23% |
| Annual Growth RONA b.I.a.T. | | | 30.10% | 4.68% | 0.67% | 125.63% | -148.29% | -313.43% | 77.36% | -26.96% | -34.56% | base year |
| EBITDA per WLU | EBITDA / WLUs | 144.1% | 6.52 € | 7.57 € | 6.93 € | 5.09 € | 3.62 € | 2.56 € | 2.83 € | 1.89 € | 2.24 € | 2.67 € |
| Inflation-Adjusted EBITDA per WLU | | 88.9% | 5.88 € | 6.94 € | 6.55 € | 4.97 € | 3.62 € | 2.65 € | 3.01 € | 2.04 € | 2.49 € | 3.11 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 209.3% | 40.52% | 37.85% | 42.05% | 33.85% | 12.35% | 6.44% | 15.20% | 10.90% | 10.17% | 13.10% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 90.5% | 22.33% | 13.67% | 15.61% | 14.20% | -27.58% | -9.98% | 9.80% | 8.06% | 8.35% | 11.72% |
| Annual Growth ROE (Shareh. Funds) | | | 63.27% | -12.38% | 9.91% | 151.48% | -176.33% | -201.85% | 21.66% | -3.52% | -28.77% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -21.2% | 41.77% | 32.41% | 33.61% | 37.45% | 127.36% | 133.25% | 39.58% | 41.24% | 49.77% | 53.01% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -36.4% | 71.73% | 47.94% | 50.63% | 59.88% | -465.48% | -400.74% | 65.50% | 70.18% | 99.09% | 112.82% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -34.4% | 0.331 | 0.317 | 0.295 | 0.288 | 0.656 | 0.555 | 0.545 | 0.564 | 0.506 | 0.505 |

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 23.9% | 58.23% | 67.59% | 66.39% | 62.55% | -27.36% | -33.25% | 60.42% | 58.76% | 50.23% | 46.99% |
| Financial Leverage | Total Assets / Shareh. Funds | -19.3% | 171.73% | 147.94% | 150.63% | 159.88% | -365.48% | -300.74% | 165.50% | 170.18% | 199.09% | 212.82% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 270.6% | 22,701 € | 18,635 € | 18,981 € | 12,249 € | 5,198 € | 3,316 € | 5,928 € | 5,345 € | 5,222 € | 6,125 € |
| Annual Growth Cash Flow | | | 21.82% | -1.83% | 54.97% | 135.66% | 56.73% | -44.06% | 10.90% | 2.35% | -14.74% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 175.4% | 6.48 € | 6.09 € | 6.59 € | 4.44 € | 1.84 € | 1.36 € | 2.41 € | 2.09 € | 2.10 € | 2.35 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 109.5% | 43.47% | 40.70% | 45.78% | 36.03% | 16.87% | 11.51% | 20.07% | 17.72% | 17.47% | 20.75% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 1082.0% | 5.419 | 2.007 | 3.557 | 9.575 | 5.826 | 1.943 | 1.190 | 3.079 | 1.211 | 0.458 |
| Tax Rate | Taxes Paid / EBT | -100.0% | -0.01% | 20.71% | 6.45% | 6.58% | 32.67% | 29.63% | 30.81% | 15.12% | 33.49% | 33.46% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -38.4% | 0.551 | 0.361 | 0.371 | 0.419 | -2.234 | -1.551 | 0.645 | 0.739 | 0.821 | 0.895 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 56,622 € | 18,512 € | 9,350 € | 13,646 € | 10,969 € | 4,306 € | 1,610 € | 946 € | 3,609 € | 909 € | -7,235 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -76.7% | 1.36 € | 3.48 € | 2.15 € | 0.54 € | 0.37 € | 0.83 € | 2.35 € | 0.77 € | 1.99 € | 5.83 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -82.0% | 1.22 € | 3.19 € | 2.03 € | 0.53 € | 0.37 € | 0.86 € | 2.50 € | 0.83 € | 2.21 € | 6.80 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -82.3% | 8.02% | 20.28% | 12.87% | 3.76% | 2.90% | 5.92% | 16.87% | 5.76% | 14.43% | 45.26% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -54.1% | 2.714 | 7.112 | 3.453 | 1.727 | 0.641 | 1.168 | 3.467 | 0.844 | 1.977 | 5.915 |

## BHX – Birmingham, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 33.1% | 32.64% | 33.75% | 29.92% | 26.33% | 20.27% | 16.44% | 14.49% | 13.92% | 12.08% | 24.52% |
| Annual Growth Operating Margin | | | -3.27% | 12.78% | 13.65% | 29.90% | 23.31% | 13.45% | 4.08% | 15.28% | -50.76% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 11.0% | 45.08% | 44.75% | 40.41% | 36.08% | 33.67% | 29.92% | 29.27% | 29.03% | 27.10% | 40.61% |
| Annual Growth EBITDA Margin | | | 0.73% | 10.74% | 11.99% | 7.16% | 12.55% | 2.19% | 0.83% | 7.12% | -33.26% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 147.9% | 27.47% | 30.61% | 25.12% | 17.11% | 11.07% | 9.08% | 7.41% | 7.57% | 5.58% | 11.08% |
| Annual Growth RONA b.I.a.T. | | | -10.27% | 21.86% | 46.84% | 54.59% | 21.82% | 22.53% | -2.11% | 35.66% | -49.60% | base year |
| EBITDA per WLU | EBITDA / WLUs | 28.6% | 8.31 € | 7.99 € | 7.45 € | 5.15 € | 4.35 € | 4.25 € | 4.46 € | 4.61 € | 4.57 € | 6.46 € |
| Inflation-Adjusted EBITDA per WLU | | -0.4% | 7.49 € | 7.33 € | 7.04 € | 5.03 € | 4.35 € | 4.39 € | 4.73 € | 4.97 € | 5.08 € | 7.53 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 105.5% | 22.06% | 21.04% | 17.76% | 49.72% | 19.74% | 14.81% | 7.36% | 8.06% | 6.15% | 10.73% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 282.8% | 18.56% | 19.09% | 14.91% | 32.31% | 10.78% | 8.18% | 3.76% | 4.38% | 2.84% | 4.85% |
| Annual Growth ROE (Shareh. Funds) | | | -2.74% | 28.01% | -53.85% | 199.76% | 31.70% | 117.42% | -14.15% | 54.27% | -41.38% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 81.3% | 55.26% | 50.10% | 43.56% | 24.09% | 23.77% | 26.34% | 24.88% | 35.12% | 28.81% | 30.48% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 181.7% | 123.51% | 100.42% | 77.19% | 31.73% | 31.18% | 35.77% | 33.12% | 54.14% | 40.46% | 43.84% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 6.8% | 0.416 | 0.488 | 0.526 | 0.593 | 0.558 | 0.527 | 0.453 | 0.422 | 0.390 | 0.389 |

## BHX – Birmingham, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -35.6% | 44.74% | 49.90% | 56.44% | 75.91% | 76.23% | 73.66% | 75.12% | 64.88% | 71.19% | 69.52% |
| Financial Leverage | Total Assets / Shareh. Funds | 55.4% | 223.51% | 200.42% | 177.19% | 131.73% | 131.18% | 135.77% | 133.12% | 154.14% | 140.46% | 143.84% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 192.6% | 46,157 € | 39,931 € | 32,430 € | 47,716 € | 23,840 € | 20,488 € | 14,549 € | 14,225 € | 12,961 € | 15,777 € |
| Annual Growth Cash Flow | | | 15.59% | 23.13% | -32.03% | 100.15% | 16.36% | 40.82% | 2.28% | 9.75% | -17.85% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 49.1% | 6.36 € | 5.72 € | 5.21 € | 8.49 € | 4.29 € | 4.02 € | 3.37 € | 3.68 € | 3.57 € | 4.26 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 28.6% | 34.49% | 32.04% | 28.25% | 59.48% | 33.14% | 28.29% | 22.14% | 23.17% | 21.18% | 26.82% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -16.1% | 0.681 | 0.704 | 0.879 | 9.960 | 2.526 | 2.483 | 1.545 | 1.201 | 1.030 | 0.811 |
| Tax Rate | Taxes Paid / EBT | -38.3% | 22.95% | 30.77% | 32.03% | 33.13% | 42.67% | 26.95% | 41.05% | 25.61% | 41.81% | 37.19% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 86.3% | 0.841 | 0.907 | 0.839 | 0.650 | 0.546 | 0.553 | 0.512 | 0.544 | 0.462 | 0.452 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 30,885 € | -21,661 € | -16,770 € | -4,464 € | 42,926 € | 14,401 € | 12,235 € | 5,134 € | 2,383 € | 373 € | -3,671 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 72.4% | 9.69 € | 8.44 € | 6.11 € | 0.88 € | 1.77 € | 1.69 € | 2.28 € | 3.20 € | 3.75 € | 5.62 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 33.5% | 8.74 € | 7.74 € | 5.77 € | 0.86 € | 1.77 € | 1.74 € | 2.42 € | 3.45 € | 4.17 € | 6.55 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 53.3% | 50.68% | 45.50% | 32.14% | 5.97% | 13.12% | 11.39% | 14.33% | 19.29% | 20.57% | 33.06% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 98.4% | 4.076 | 4.136 | 3.064 | 0.612 | 0.979 | 0.845 | 0.969 | 1.276 | 1.369 | 2.055 |

## BRS – Bristol, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 170.6% | 31.45% | 34.26% | -31.43% | 19.17% | 20.93% | 20.62% | 17.73% | 15.45% | 7.34% | 11.62% |
| Annual Growth Operating Margin | | | -8.20% | 208.99% | -263.98% | -8.40% | 1.48% | 16.30% | 14.81% | 110.39% | -36.83% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 86.1% | 36.55% | 39.63% | -26.00% | 24.64% | 27.16% | 26.76% | 23.76% | 21.57% | 15.61% | 19.64% |
| Annual Growth EBITDA Margin | | | -7.78% | 252.42% | -205.54% | -9.28% | 1.51% | 12.62% | 10.15% | 38.17% | -20.53% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 334.6% | 55.01% | 71.11% | -86.85% | 25.59% | 29.36% | 28.68% | 26.47% | 22.86% | 8.41% | 12.66% |
| Annual Growth RONA b.I.a.T. | | | -22.64% | 181.88% | -439.32% | -12.82% | 2.35% | 8.37% | 15.77% | 171.88% | -33.57% | base year |
| EBITDA per WLU | EBITDA / WLUs | 79.0% | 8.64 € | 8.68 € | -5.66 € | 5.40 € | 5.28 € | 5.37 € | 5.28 € | 5.00 € | 3.87 € | 4.82 € |
| Inflation-Adjusted EBITDA per WLU | | 38.6% | 7.79 € | 7.95 € | -5.35 € | 5.27 € | 5.28 € | 5.54 € | 5.60 € | 5.39 € | 4.30 € | 5.62 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 198.1% | 22.04% | 24.52% | -20.88% | 11.69% | 13.01% | 12.85% | 10.22% | 8.77% | 3.00% | 7.39% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 378.8% | 38.54% | 50.88% | -57.68% | 15.61% | 18.25% | 17.88% | 15.25% | 12.98% | 3.44% | 8.05% |
| Annual Growth ROE (Shareh. Funds) | | | -24.26% | 188.21% | -469.42% | -14.46% | 2.11% | 17.21% | 17.54% | 277.39% | -57.28% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 65.9% | 68.65% | 62.96% | 63.44% | 40.25% | 42.54% | 43.00% | 43.58% | 45.26% | 42.12% | 41.37% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 210.4% | 219.00% | 170.00% | 173.49% | 67.37% | 74.02% | 75.44% | 77.23% | 82.67% | 72.76% | 70.56% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -25.9% | 0.607 | 0.954 | 1.391 | 1.199 | 1.183 | 1.189 | 1.248 | 1.185 | 0.863 | 0.819 |

## BRS – Bristol, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -46.5% | 31.35% | 37.04% | 36.56% | 59.75% | 57.46% | 57.00% | 56.42% | 54.74% | 57.88% | 58.63% |
| Financial Leverage | Total Assets / Shareh. Funds | 87.0% | 319.00% | 270.00% | 273.49% | 167.37% | 174.02% | 175.44% | 177.23% | 182.67% | 172.76% | 170.56% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 320.2% | 13,233 € | 12,469 € | -6,029 € | 5,593 € | 5,706 € | 5,245 € | 4,487 € | 3,829 € | 2,351 € | 3,149 € |
| Annual Growth Cash Flow | | | 6.13% | 306.83% | -207.80% | -1.99% | 8.79% | 16.90% | 17.17% | 62.90% | -25.35% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 69.4% | 6.41 € | 6.54 € | -3.36 € | 3.76 € | 3.74 € | 3.81 € | 3.61 € | 3.45 € | 2.79 € | 3.79 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 76.1% | 27.13% | 29.89% | -15.45% | 17.16% | 19.24% | 18.99% | 16.24% | 14.89% | 11.27% | 15.41% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -66.0% | 0.364 | 0.682 | -1.063 | 2.305 | 1.130 | 1.468 | 1.822 | 1.871 | 1.609 | 1.072 |
| Tax Rate | Taxes Paid / EBT | -6.5% | 29.96% | 30.83% | -32.20% | 39.83% | 37.87% | 36.99% | 39.92% | 40.41% | 52.69% | 32.04% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 60.6% | 1.749 | 2.075 | 2.763 | 1.335 | 1.403 | 1.391 | 1.493 | 1.480 | 1.145 | 1.089 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90/99 -30,203 € | -23,084 € | -5,824 € | -11,698 € | 3,166 € | 657 € | 1,673 € | 2,025 € | 1,783 € | 889 € | 211 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 400.3% | 18.35 € | 10.03 € | 3.30 € | 1.71 € | 3.47 € | 2.75 € | 2.12 € | 1.93 € | 1.81 € | 3.67 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 287.2% | 16.55 € | 9.19 € | 3.12 € | 1.67 € | 3.47 € | 2.83 € | 2.25 € | 2.08 € | 2.02 € | 4.28 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 417.9% | 74.47% | 43.85% | 14.53% | 7.45% | 17.03% | 12.93% | 8.91% | 7.96% | 7.01% | 14.38% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 714.6% | 14.604 | 8.161 | 2.675 | 1.362 | 2.733 | 2.109 | 1.480 | 1.300 | 0.847 | 1.793 |

## BRU – Brussels, Belgium

## Financial Ratio Analysis (FRA)

| Group 1: Profitability | | Growth 90-97 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 207.3% | n/a | n/a | 35.97% | 29.22% | 24.87% | 23.93% | 18.08% | 13.13% | 12.21% | 11.71% |
| Annual Growth Operating Margin | | | n/a | n/a | 23.09% | 17.47% | 3.95% | 32.32% | 37.79% | 7.53% | 4.28% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 3.4% | n/a | n/a | 52.81% | 48.89% | 46.11% | 47.13% | 44.84% | 36.90% | 42.29% | 51.08% |
| Annual Growth EBITDA Margin | | | n/a | n/a | 8.01% | 6.03% | -2.17% | 5.12% | 21.50% | -12.75% | -17.21% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 248.2% | n/a | n/a | 41.95% | 34.30% | 32.30% | 26.18% | 17.77% | 12.74% | 11.68% | 12.05% |
| Annual Growth RONA b.I.a.T. | | | n/a | n/a | 22.30% | 6.18% | 23.40% | 47.34% | 39.51% | 9.08% | -3.09% | base year |
| EBITDA per WLU | EBITDA / WLUs | 53.6% | n/a | n/a | 3.74 € | 3.65 € | 3.49 € | 3.15 € | 2.70 € | 2.02 € | 2.16 € | 2.44 € |
| Inflation-Adjusted EBITDA per WLU | | 31.2% | n/a | n/a | 3.61 € | 3.57 € | 3.49 € | 3.19 € | 2.81 € | 2.16 € | 2.36 € | 2.75 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 29.4% | n/a | n/a | 14.46% | 12.25% | 4.98% | 6.04% | 6.35% | 8.94% | 11.40% | 11.18% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 46.6% | n/a | n/a | 16.87% | 14.38% | 6.47% | 6.60% | 6.23% | 8.67% | 10.90% | 11.50% |
| Annual Growth ROE (Shareh. Funds) | | | n/a | n/a | 17.32% | 122.16% | -2.01% | 5.94% | -28.13% | -20.43% | -5.23% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 50.8% | n/a | n/a | 66.94% | 72.11% | 78.40% | 77.07% | 73.98% | 66.29% | 55.30% | 44.39% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 153.6% | n/a | n/a | 202.44% | 258.51% | 362.86% | 336.10% | 284.29% | 196.61% | 123.72% | 79.82% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -54.7% | n/a | n/a | 0.438 | 0.363 | 0.329 | 0.278 | 0.319 | 0.511 | 0.977 | 0.968 |

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-97 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -40.5% | n/a | n/a | 33.06% | 27.89% | 21.60% | 22.93% | 26.02% | 33.71% | 44.70% | 55.61% |
| Financial Leverage | Total Assets / Shareh. Funds | 68.2% | n/a | n/a | 302.44% | 358.51% | 462.86% | 436.10% | 384.29% | 296.61% | 223.72% | 179.82% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 68.3% | n/a | n/a | 46,829 € | 42,844 € | 33,602 € | 29,641 € | 26,396 € | 22,511 € | 24,386 € | 27,833 € |
| Annual Growth Cash Flow | | | n/a | n/a | 9.30% | 27.51% | 13.36% | 12.29% | 17.26% | -7.69% | -12.38% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -8.0% | n/a | n/a | 2.22 € | 2.38 € | 1.99 € | 1.95 € | 1.99 € | 1.79 € | 2.12 € | 2.41 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -38.1% | n/a | n/a | 31.30% | 31.92% | 26.22% | 29.24% | 33.10% | 32.72% | 41.48% | 50.55% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 97,96,94,93<br>2215.6% | n/a | n/a | 4.610 | 3.575 | n/a | 0.226 | 0.194 | n/a | n/a | n/a |
| Tax Rate | Taxes Paid / EBT | 15.0% | n/a | n/a | 39.62% | 50.20% | 74.17% | 11.11% | -0.20% | 12.66% | 28.30% | 34.46% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 13.3% | n/a | n/a | 1.166 | 1.174 | 1.299 | 1.094 | 0.982 | 0.970 | 0.956 | 1.029 |
| Owner Earnings (in '000) | Cash Fl. – Investm. | Σ 97,96,94,93<br>-143,711 € | n/a | n/a | 36,671 € | 30,861 € | n/a | -101,348 € | -109,895 € | n/a | n/a | n/a |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 97,96,94,93<br>-95.3% | n/a | n/a | 0.64 € | 0.90 € | n/a | 11.66 € | 13.59 € | n/a | n/a | n/a |
| Infl.-Adj. Capital Exp. per Term. PAX | | 97,96,94,93<br>-95.6% | n/a | n/a | 0.62 € | 0.88 € | n/a | 11.82 € | 14.11 € | n/a | n/a | n/a |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 97,96,94,93<br>-96.0% | n/a | n/a | 6.79% | 8.93% | n/a | 129.22% | 170.89% | n/a | n/a | n/a |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 97,96,94,93<br>-93.7% | n/a | n/a | 0.403 | 0.454 | n/a | 5.569 | 6.388 | n/a | n/a | n/a |

## BSL – Basel Mulhouse, Switzerland (France)

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -28.0% | 6.49% | 8.18% | 9.99% | 9.41% | 13.10% | 12.35% | 9.75% | 10.62% | 9.48% | 9.01% |
| Annual Growth Operating Margin | | | -20.63% | -18.15% | 6.13% | -28.11% | 6.08% | 26.65% | -8.23% | 12.04% | 5.18% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 22.1% | 49.65% | 46.56% | 45.38% | 43.35% | 44.69% | 45.15% | 45.30% | 45.98% | 44.24% | 40.66% |
| Annual Growth EBITDA Margin | | | 6.64% | 2.58% | 4.68% | -2.99% | -1.03% | -0.32% | -1.48% | 3.92% | 8.81% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Annual Growth RONA b.I.a.T. | | | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| EBITDA per WLU | EBITDA / WLUs | 55.4% | 6.90 € | 6.19 € | 6.61 € | 6.19 € | 6.38 € | 6.45 € | 6.17 € | 5.83 € | 5.63 € | 4.44 € |
| Inflation-Adjusted EBITDA per WLU | | 33.1% | 6.60 € | 5.95 € | 6.41 € | 6.07 € | 6.38 € | 6.56 € | 6.39 € | 6.16 € | 6.09 € | 4.96 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 1061.5% | 0.29% | 0.56% | 5.93% | 2.98% | -4.77% | -9.14% | -5.25% | 6.70% | 0.02% | 0.03% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Annual Growth ROE (Shareh. Funds) | | | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 0.0% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 117.9% | 0.354 | 0.350 | 0.258 | 0.240 | 0.233 | 0.223 | 0.212 | 0.211 | 0.187 | 0.162 |

## BSL – Basel Mulhouse, Switzerland (France) — Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Financial Leverage | Total Assets / Shareh. Funds | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 248.3% | 25,761 € | 19,270 € | 18,869 € | 15,684 € | 10,687 € | 8,347 € | 9,660 € | 12,428 € | 9,368 € | 7,396 € |
| Annual Growth Cash Flow | | | 33.69% | 2.13% | 20.31% | 46.75% | 28.04% | -13.59% | -22.27% | 32.66% | 26.66% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 74.6% | 6.04 € | 5.18 € | 6.02 € | 5.27 € | 3.83 € | 3.38 € | 4.13 € | 5.33 € | 4.43 € | 3.46 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 37.2% | 43.45% | 38.94% | 41.32% | 36.91% | 26.82% | 23.66% | 30.30% | 42.06% | 34.78% | 31.68% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 48.9% | 0.550 | 0.773 | 0.985 | 0.689 | 0.592 | 0.551 | 0.606 | 1.118 | 0.498 | 0.370 |
| Tax Rate | Taxes Paid / EBT | -50.9% | 111.21% | 124.29% | 43.90% | 64.72% | 470.33% | 76.06% | 119.67% | 44.24% | 413.30% | 226.69% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Owner Earnings (in '000) | Cash Flow – Investment | Σ 90-99 -75,238 € | -21,040 € | -5,655 € | -296 € | -7,063 € | -7,361 € | -6,799 € | -6,282 € | 1,313 € | -9,439 € | -12,615 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 22.3% | 13.24 € | 8.34 € | 7.26 € | 9.31 € | 7.62 € | 6.95 € | 7.75 € | 5.53 € | 10.18 € | 10.82 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 4.8% | 12.65 € | 8.02 € | 7.04 € | 9.13 € | 7.62 € | 7.07 € | 8.03 € | 5.84 € | 11.00 € | 12.08 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -7.9% | 78.93% | 50.37% | 41.97% | 53.54% | 45.30% | 42.94% | 50.01% | 37.61% | 69.83% | 85.70% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -32.5% | 1.829 | 1.312 | 1.186 | 1.578 | 1.434 | 1.309 | 1.407 | 1.064 | 2.009 | 2.708 |

## CGN – Cologne, Germany

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 65.0% | 6.33% | -0.27% | 14.55% | 19.03% | 0.30% | 0.46% | 0.20% | 2.18% | 3.51% | 3.84% |
| Annual Growth Operating Margin | | | 2420.83% | -101.87% | -23.54% | 6214.21% | -34.35% | 131.44% | -90.89% | -37.95% | -8.47% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 1.4% | 23.25% | 19.05% | 31.54% | 35.16% | 15.80% | 22.99% | 18.98% | 17.38% | 22.34% | 22.94% |
| Annual Growth EBITDA Margin | | | 22.05% | -39.60% | -10.31% | 122.61% | -31.30% | 21.17% | 9.17% | -22.20% | -2.59% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 143.5% | 19.20% | -0.81% | 36.89% | 72.76% | 0.69% | 0.89% | 0.34% | 6.19% | 8.65% | 7.89% |
| Annual Growth RONA b.I.a.T. | | | 2466.95% | -102.20% | -49.30% | 10451.55% | -22.20% | 157.67% | -94.44% | -28.50% | 9.76% | base year |
| EBITDA per WLU | EBITDA / WLUs | 18.4% | 4.13 € | 3.42 € | 5.48 € | 6.58 € | 3.10 € | 4.45 € | 3.60 € | 3.26 € | 3.81 € | 3.49 € |
| Inflation-Adjusted EBITDA per WLU | | -5.4% | 3.93 € | 3.28 € | 5.31 € | 6.48 € | 3.10 € | 4.52 € | 3.76 € | 3.56 € | 4.37 € | 4.16 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 96-99 112.3% | 1.84% | -5.15% | 14.16% | -14.95% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 96-99 109.8% | 5.58% | -15.31% | 35.89% | -57.14% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Annual Growth ROE (Shareh. Funds) | | | 136.43% | -142.66% | 162.82% | base year | n/a | n/a | n/a | n/a | n/a | n/a |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 14.2% | 85.73% | 84.51% | 72.84% | 80.23% | 67.00% | 66.23% | 65.91% | 78.87% | 75.84% | 75.05% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 99.6% | 600.54% | 545.44% | 268.22% | 405.83% | 203.01% | 196.14% | 193.33% | 373.24% | 313.84% | 300.86% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -17.6% | 0.503 | 0.548 | 0.790 | 0.918 | 1.019 | 0.894 | 0.809 | 0.805 | 0.738 | 0.610 |

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -42.8% | 14.27% | 15.49% | 27.16% | 19.77% | 33.00% | 33.77% | 34.09% | 21.13% | 24.16% | 24.95% |
| Financial Leverage | Total Assets / Shareh. Funds | 74.8% | 700.54% | 645.44% | 368.22% | 505.83% | 303.01% | 296.14% | 293.33% | 473.24% | 413.84% | 400.86% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 135.7% | 33,688 € | 23,332 € | 50,431 € | 1,927 € | 23,848 € | 28,968 € | 21,459 € | 15,982 € | 16,996 € | 14,293 € |
| Annual Growth Cash Flow | | | 44.38% | -53.73% | 2517.64% | -91.92% | -17.68% | 34.99% | 34.27% | -5.97% | 18.91% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 14.7% | 3.33 € | 2.54 € | 5.41 € | 0.22 € | 3.04 € | 4.36 € | 3.56 € | 2.86 € | 3.21 € | 2.90 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -1.8% | 18.76% | 14.17% | 31.14% | 1.19% | 15.49% | 22.53% | 18.78% | 15.20% | 18.83% | 19.10% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -9.1% | 0.400 | 0.193 | 0.812 | 0.036 | 0.725 | 0.946 | 0.755 | 0.593 | 1.029 | 0.439 |
| Tax Rate | Taxes Paid / EBT | -87.3% | 12.67% | 68.35% | 1.69% | 1.30% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 47.5% | 3.033 | 2.974 | 2.535 | 3.823 | 2.288 | 1.931 | 1.734 | 2.841 | 2.465 | 2.056 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -258,190 € | -50,607 € | -97,718 € | -11,703 € | -51,761 € | -9,059 € | -1,659 € | -6,956 € | -10,965 € | 473 € | -18,234 € |
| Capital Expenditure per Terminal Passengers | Investment / Terminal PAX | 34.7% | 14.02 € | 22.33 € | 11.66 € | 10.23 € | 6.90 € | 7.65 € | 7.37 € | 7.57 € | 5.37 € | 10.41 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 7.6% | 13.37 € | 21.41 € | 11.28 € | 10.09 € | 6.90 € | 7.78 € | 7.70 € | 8.26 € | 6.15 € | 12.42 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 8.0% | 46.93% | 73.52% | 38.37% | 33.03% | 21.38% | 23.82% | 24.86% | 25.63% | 18.31% | 43.47% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 21.9% | 2.774 | 3.805 | 2.259 | 2.048 | 1.380 | 1.057 | 1.324 | 1.686 | 0.972 | 2.276 |

## CPH – Copenhagen, Denmark

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 46.4% | 36.08% | 37.74% | 36.59% | 34.00% | 37.14% | 33.58% | 29.32% | 27.66% | 24.98% | 24.64% |
| Annual Growth Operating Margin | | | -4.42% | 3.16% | 7.61% | -8.45% | 10.60% | 14.54% | 6.00% | 10.71% | 1.40% | base year |
| EBITDA Margin | EBITA / Total Revenue | 41.7% | 56.23% | 56.13% | 55.24% | 52.77% | 54.12% | 49.57% | 46.36% | 43.38% | 38.70% | 39.69% |
| Annual Growth EBITDA Margin | | | 0.16% | 1.62% | 4.68% | -2.50% | 9.19% | 6.92% | 6.87% | 12.08% | -2.48% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -6.1% | 25.38% | 28.53% | 29.84% | 29.78% | 32.09% | 28.82% | 26.29% | 29.14% | 26.05% | 27.02% |
| Annual Growth RONA b.I.a.T. | | | -11.04% | -4.36% | 0.18% | -7.18% | 11.35% | 9.60% | -9.76% | 11.86% | -3.61% | base year |
| EBITDA per WLU | EBITDA / WLUs | 87.5% | 6.51 € | 6.31 € | 5.67 € | 5.62 € | 5.33 € | 4.37 € | 4.01 € | 4.35 € | 3.57 € | 3.47 € |
| Inflation-Adjusted EBITDA per WLU | | 56.2% | 5.98 € | 5.94 € | 5.43 € | 5.50 € | 5.33 € | 4.46 € | 4.17 € | 4.58 € | 3.85 € | 3.83 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 377.4% | 21.02% | 23.46% | 21.10% | 19.59% | 20.27% | 17.05% | 14.34% | 12.73% | 8.54% | 4.40% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 206.3% | 14.79% | 17.73% | 17.21% | 17.16% | 17.52% | 14.64% | 12.86% | 13.41% | 8.91% | 4.83% |
| Annual Growth ROE (Shareh. Funds) | | | -16.59% | 3.06% | 0.29% | -2.05% | 19.70% | 13.78% | -4.10% | 50.59% | 84.40% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -0.9% | 59.87% | 62.21% | 58.28% | 56.31% | 52.22% | 56.91% | 56.21% | 60.45% | 62.77% | 60.38% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -2.1% | 149.16% | 164.61% | 139.71% | 128.91% | 109.31% | 132.06% | 128.39% | 152.86% | 168.61% | 152.42% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -39.0% | 0.304 | 0.307 | 0.361 | 0.435 | 0.447 | 0.417 | 0.461 | 0.499 | 0.442 | 0.498 |

## CPH – Copenhagen, Denmark

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 1.3% | 40.13% | 37.79% | 41.72% | 43.69% | 47.78% | 43.09% | 43.79% | 39.55% | 37.23% | 39.62% |
| Financial Leverage | Total Assets / Shareh. Funds | -1.3% | 249.16% | 264.61% | 239.71% | 228.91% | 209.31% | 232.06% | 228.39% | 252.86% | 268.61% | 252.42% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 301.8% | 97,832 € | 92,378 € | 81,005 € | 74,460 € | 62,151 € | 46,036 € | 40,150 € | 39,303 € | 27,373 € | 24,347 € |
| Annual Growth Cash Flow | | | 5.90% | 14.04% | 8.79% | 19.80% | 35.01% | 14.66% | 2.16% | 43.58% | 12.43% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 180.1% | 4.77 € | 4.71 € | 4.08 € | 4.08 € | 3.67 € | 2.92 € | 2.71 € | 2.85 € | 2.06 € | 1.70 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 111.63% | 41.17% | 41.85% | 39.75% | 38.36% | 37.26% | 33.04% | 31.39% | 28.45% | 22.26% | 19.46% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -60.0% | 0.976 | 0.477 | 0.484 | 0.665 | 1.098 | 0.671 | 1.785 | 2.242 | 0.686 | 2.438 |
| Tax Rate | Taxes Paid / EBT | 33.3% | 30.57% | 26.65% | 33.90% | 33.79% | 34.23% | 35.14% | 36.04% | 31.53% | 38.41% | 22.92% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -35.8% | 0.704 | 0.756 | 0.815 | 0.876 | 0.864 | 0.858 | 0.897 | 1.054 | 1.043 | 1.097 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -203,327 € | -2,387 € | -101,395 € | -86,230 € | -37,576 € | 5,568 € | -22,582 € | 17,662 € | 21,769 € | -12,519 € | 14,363 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 624.0% | 5.77 € | 11.68 € | 10.01 € | 7.15 € | 3.92 € | 5.06 € | 1.78 € | 1.47 € | 3.48 € | 0.80 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 503.0% | 5.30 € | 10.98 € | 9.58 € | 7.00 € | 3.92 € | 5.16 € | 1.86 € | 1.55 € | 3.75 € | 0.88 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 428.7% | 42.18% | 87.78% | 82.07% | 57.71% | 33.92% | 49.25% | 17.58% | 12.69% | 32.45% | 7.98% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 294.9% | 2.093 | 4.773 | 4.400 | 3.075 | 1.997 | 3.080 | 1.031 | 0.807 | 2.365 | 0.530 |

## CWL – Cardiff, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 152.0% | 39.64% | 42.36% | 39.47% | 35.75% | 39.15% | 24.79% | 21.77% | 12.90% | 1.42% | 15.73% |
| Annual Growth Operating Margin | | | -6.44% | 7.33% | 10.40% | -8.67% | 57.92% | 13.84% | 68.77% | 808.94% | -90.97% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 68.1% | 44.68% | 47.31% | 44.43% | 41.83% | 48.88% | 36.20% | 30.01% | 23.39% | 13.56% | 26.58% |
| Annual Growth EBITDA Margin | | | -5.56% | 6.49% | 6.21% | -14.43% | 35.05% | 20.62% | 28.28% | 72.54% | -49.00% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 305.5% | 17.48% | 11.63% | 10.92% | 10.89% | 13.73% | 8.90% | 8.24% | 3.82% | 0.36% | 4.31% |
| Annual Growth RONA b.I.a.T. | | | 50.31% | 6.45% | 0.36% | -20.72% | 54.18% | 8.10% | 115.73% | 970.83% | -91.73% | base year |
| EBITDA per WLU | EBITDA / WLUs | 114.0% | 9.78 € | 9.38 € | 8.88 € | 7.16 € | 7.80 € | 5.82 € | 5.32 € | 3.82 € | 2.38 € | 4.57 € |
| Inflation-Adjusted EBITDA per WLU | | 65.7% | 8.83 € | 8.59 € | 8.39 € | 6.99 € | 7.80 € | 6.01 € | 5.64 € | 4.12 € | 2.64 € | 5.33 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 494.9% | 39.48% | 41.46% | 35.97% | 34.69% | 38.65% | 15.19% | 16.54% | 11.13% | 3.84% | 6.64% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 857.3% | 17.41% | 11.38% | 9.95% | 10.56% | 13.56% | 5.46% | 6.26% | 3.29% | 0.96% | 1.82% |
| Annual Growth ROE (Shareh. Funds) | | | 52.98% | 14.32% | -5.73% | -22.10% | 148.40% | -12.79% | 90.03% | 241.49% | -46.98% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 0.8% | 27.58% | 16.05% | 15.88% | 18.75% | 20.59% | 31.07% | 22.30% | 26.78% | 23.55% | 27.37% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 1.1% | 38.08% | 19.12% | 18.88% | 23.07% | 25.93% | 45.08% | 28.69% | 36.58% | 30.80% | 37.69% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 31.7% | 0.331 | 0.313 | 0.291 | 0.292 | 0.308 | 0.295 | 0.364 | 0.283 | 0.235 | 0.251 |

## CWL – Cardiff, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -0.3% | 72.42% | 83.95% | 84.12% | 81.25% | 79.41% | 68.93% | 77.70% | 73.22% | 76.45% | 72.63% |
| Financial Leverage | Total Assets / Shareh. Funds | 0.3% | 138.08% | 119.12% | 118.88% | 123.07% | 125.93% | 145.08% | 128.69% | 136.58% | 130.80% | 137.69% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 604.1% | 13,054 € | 11,741 € | 9,579 € | 7,366 € | 8,381 € | 4,398 € | 3,604 € | 2,359 € | 1,570 € | 1,854 € |
| Annual Growth Cash Flow | | | 11.19% | 22.57% | 30.04% | -12.11% | 90.57% | 22.02% | 52.75% | 50.32% | -15.34% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 224.2% | 9.75 € | 9.20 € | 8.18 € | 6.97 € | 7.72 € | 4.28 € | 4.39 € | 3.53 € | 2.80 € | 3.01 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 154.6% | 44.52% | 46.40% | 40.92% | 40.76% | 48.39% | 26.60% | 24.77% | 21.62% | 15.98% | 17.49% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 1676.1% | 7.050 | 2.724 | 3.697 | 2.842 | 1.694 | 0.854 | 1.047 | 1.651 | 3.535 | 0.397 |
| Tax Rate | Taxes Paid / EBT | -104.0% | -1.72% | 0.00% | 7.54% | -1.16% | 0.00% | 33.80% | 23.70% | 21.84% | 9.86% | 43.46% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 60.9% | 0.441 | 0.275 | 0.277 | 0.304 | 0.351 | 0.359 | 0.378 | 0.296 | 0.251 | 0.274 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 32,475 € | 11,203 € | 7,430 € | 6,987 € | 4,774 € | 3,432 € | -754 € | 163 € | 930 € | 1,126 € | -2,816 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -82.4% | 1.42 € | 3.45 € | 2.27 € | 2.52 € | 4.70 € | 5.14 € | 4.27 € | 2.19 € | 0.81 € | 8.04 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -86.4% | 1.28 € | 3.16 € | 2.15 € | 2.46 € | 4.70 € | 5.30 € | 4.53 € | 2.36 € | 0.91 € | 9.37 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -85.7% | 6.31% | 17.04% | 11.07% | 14.34% | 28.57% | 31.16% | 23.65% | 13.09% | 4.52% | 44.06% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -69.2% | 1.252 | 3.445 | 2.234 | 2.361 | 2.934 | 2.731 | 2.872 | 1.248 | 0.372 | 4.059 |

## DUS – Dusseldorf, Germany

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-95** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -28.7% | n/a | n/a | n/a | n/a | 21.20% | 19.30% | 21.28% | 26.14% | 26.42% | 29.74% |
| Annual Growth Operating Margin | | | n/a | n/a | n/a | n/a | 9.84% | -9.28% | -18.60% | -1.05% | -11.16% | base year |
| EBITDA Margin | EBITDA / Total Revenue | -22.3% | n/a | n/a | n/a | n/a | 39.32% | 40.27% | 35.66% | 39.76% | 43.61% | 50.63% |
| Annual Growth EBITDA Margin | | | n/a | n/a | n/a | n/a | -2.35% | 12.92% | -10.29% | -8.84% | -13.87% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -54.6% | n/a | n/a | n/a | n/a | 53.60% | 46.28% | 44.21% | 54.51% | 56.00% | 118.15% |
| Annual Growth RONA b.I.a.T. | | | n/a | n/a | n/a | n/a | 15.81% | 4.68% | -18.90% | -2.65% | -52.61% | base year |
| EBITDA per WLU | EBITDA / WLUs | -30.3% | n/a | n/a | n/a | n/a | 7.23 € | 7.37 € | 6.43 € | 7.10 € | 8.81 € | 10.37 € |
| Inflation-Adjusted EBITDA per WLU | | -41.6% | n/a | n/a | n/a | n/a | 7.23 € | 7.50 € | 6.72 € | 7.75 € | 10.10 € | 12.38 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -48.9% | n/a | n/a | n/a | n/a | 6.63% | 6.16% | 9.88% | 9.28% | 10.18% | 12.98% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -67.5% | n/a | n/a | n/a | n/a | 16.77% | 14.77% | 20.52% | 19.36% | 21.58% | 51.57% |
| Annual Growth ROE (Shareh. Funds) | | | n/a | n/a | n/a | n/a | 13.51% | -28.02% | 6.01% | -10.28% | -58.16% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -3.7% | n/a | n/a | n/a | n/a | 74.91% | 75.06% | 72.82% | 70.12% | 68.04% | 77.79% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -14.7% | n/a | n/a | n/a | n/a | 298.59% | 301.03% | 267.91% | 234.65% | 212.84% | 350.24% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -32.5% | n/a | n/a | n/a | n/a | 0.689 | 0.637 | 0.616 | 0.689 | 0.760 | 1.020 |

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-95 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 13.0% | n/a | n/a | n/a | n/a | 25.09% | 24.94% | 27.18% | 29.88% | 31.96% | 22.21% |
| Financial Leverage | Total Assets / Shareh. Funds | -11.5% | n/a | n/a | n/a | n/a | 398.59% | 401.03% | 367.91% | 334.65% | 312.84% | 450.24% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | -15.2% | n/a | n/a | n/a | n/a | 71,185 € | 71,524 € | 58,842 € | 52,093 € | 64,400 € | 83,912 € |
| Annual Growth Cash Flow | | | n/a | n/a | n/a | n/a | -0.47% | 21.55% | 12.96% | -19.11% | -23.25% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -34.4% | n/a | n/a | n/a | n/a | 4.55 € | 4.96 € | 4.37 € | 4.09 € | 5.53 € | 6.94 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -26.9% | n/a | n/a | n/a | n/a | 24.75% | 27.13% | 24.26% | 22.90% | 27.37% | 33.88% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 1.6% | n/a | n/a | n/a | n/a | 1.332 | 0.978 | 0.772 | 1.029 | 0.603 | 1.311 |
| Tax Rate | Taxes Paid / EBT | 4.5% | n/a | n/a | n/a | n/a | 51.68% | 48.23% | 61.01% | 52.81% | 51.46% | 49.44% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -36.4% | n/a | n/a | n/a | n/a | 2.528 | 2.398 | 2.078 | 2.085 | 2.120 | 3.973 |
| Owner Earnings (in '000) | Cash Flow - Investment | ∑ 90-95 -22,207 € | n/a | n/a | n/a | n/a | 17,738 € | -1,597 € | -17,334 € | 1,453 € | -42,362 € | 19,895 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -35.6% | n/a | n/a | n/a | n/a | 3.56 € | 5.27 € | 5.90 € | 4.16 € | 9.57 € | 5.53 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -46.1% | n/a | n/a | n/a | n/a | 3.56 € | 5.37 € | 6.16 € | 4.54 € | 10.97 € | 6.60 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -28.1% | n/a | n/a | n/a | n/a | 18.59% | 27.73% | 31.41% | 22.26% | 45.38% | 25.85% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -17.1% | n/a | n/a | n/a | n/a | 1.026 | 1.323 | 2.183 | 1.635 | 2.639 | 1.237 |

## EDI – Edinburgh, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 40.6% | 32.90% | 34.23% | 35.10% | 33.25% | 32.18% | 31.96% | 34.97% | 34.02% | 26.38% | 23.39% |
| Annual Growth Operating Margin | | | -3.90% | -2.46% | 5.56% | 3.33% | 0.66% | -8.60% | 2.80% | 28.98% | 12.76% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 47.7% | 44.09% | 43.15% | 43.31% | 38.96% | 38.03% | 36.99% | 39.06% | 38.63% | 32.04% | 29.86% |
| Annual Growth EBITDA Margin | | | 2.16% | -0.36% | 11.17% | 2.46% | 2.81% | -5.31% | 1.12% | 20.55% | 7.32% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 146.9% | 25.32% | 29.51% | 33.35% | 31.37% | 21.99% | 21.46% | 23.47% | 20.87% | 12.69% | 10.25% |
| Annual Growth RONA b.I.a.T. | | | -14.22% | -11.50% | 6.29% | 42.66% | 2.47% | -8.57% | 12.49% | 64.46% | 23.76% | base year |
| EBITDA per WLU | EBITDA / WLUs | 43.8% | 5.36 € | 5.39 € | 5.37 € | 4.51 € | 4.03 € | 4.23 € | 4.92 € | 4.78 € | 4.35 € | 3.73 € |
| Inflation-Adjusted EBITDA per WLU | | 11.3% | 4.84 € | 4.94 € | 5.08 € | 4.40 € | 4.03 € | 4.36 € | 5.22 € | 5.15 € | 4.84 € | 4.35 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 63.8% | 23.12% | 22.98% | 15.14% | 20.52% | 19.37% | 20.47% | 22.85% | 22.92% | 16.07% | 14.12% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 187.5% | 17.79% | 19.81% | 14.38% | 19.36% | 13.24% | 13.74% | 15.34% | 14.06% | 7.73% | 6.19% |
| Annual Growth ROE (Shareh. Funds) | | | -10.21% | 37.74% | -25.71% | 46.26% | -3.66% | -10.41% | 9.09% | 81.87% | 24.96% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 363.2% | 64.88% | 59.77% | 54.32% | 46.81% | 40.06% | 33.96% | 26.71% | 22.73% | 15.93% | 14.01% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 1034.3% | 184.78% | 148.59% | 118.91% | 87.99% | 66.84% | 51.43% | 36.44% | 29.42% | 18.94% | 16.29% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -20.3% | 0.315 | 0.371 | 0.463 | 0.539 | 0.434 | 0.470 | 0.532 | 0.505 | 0.422 | 0.395 |

## EDI – Edinburgh, UK

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -59.2% | 35.12% | 40.23% | 45.68% | 53.19% | 59.94% | 66.04% | 73.29% | 77.27% | 84.07% | 85.99% |
| Financial Leverage | Total Assets / Shareh. Funds | 144.9% | 284.78% | 248.59% | 218.91% | 187.99% | 166.84% | 151.43% | 136.44% | 129.42% | 118.94% | 116.29% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 260.4% | 23,861 € | 20,004 € | 13,505 € | 12,920 € | 10,044 € | 9,859 € | 10,421 € | 9,372 € | 7,580 € | 6,620 € |
| Annual Growth Cash Flow | | | 19.28% | 48.12% | 4.53% | 28.63% | 1.88% | -5.39% | 11.19% | 23.64% | 14.50% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 62.3% | 4.17 € | 3.99 € | 2.90 € | 3.04 € | 2.67 € | 2.91 € | 3.39 € | 3.40 € | 2.95 € | 2.57 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 66.7% | 34.31% | 31.91% | 23.36% | 26.23% | 25.22% | 25.49% | 26.94% | 27.53% | 21.74% | 20.58% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -69.3% | 0.456 | 0.413 | 0.556 | 0.673 | 0.820 | 0.851 | 2.246 | 2.432 | 2.255 | 1.486 |
| Tax Rate | Taxes Paid / EBT | -77.1% | 9.29% | 21.39% | 26.41% | 29.46% | 32.37% | 31.39% | 33.55% | 30.43% | 36.52% | 40.66% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 75.6% | 0.770 | 0.862 | 0.950 | 0.944 | 0.683 | 0.671 | 0.671 | 0.613 | 0.481 | 0.438 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -60,166 € | -28,466 € | -28,392 € | -10,803 € | -6,268 € | -2,201 € | -1,721 € | 5,781 € | 5,518 € | 4,219 € | 2,167 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 445.7% | 10.01 € | 10.49 € | 5.71 € | 4.95 € | 3.61 € | 3.81 € | 1.66 € | 1.51 € | 1.39 € | 1.84 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 322.4% | 9.03 € | 9.61 € | 5.39 € | 4.84 € | 3.61 € | 3.93 € | 1.76 € | 1.63 € | 1.55 € | 2.14 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 443.3% | 75.24% | 77.19% | 42.04% | 38.96% | 30.75% | 29.94% | 12.00% | 11.32% | 9.64% | 13.85% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 214.1% | 6.723 | 8.651 | 5.117 | 6.818 | 5.255 | 5.960 | 2.933 | 2.456 | 1.701 | 2.141 |

## EMA – East Midlands, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 95.8% | 39.87% | 39.83% | 38.14% | 37.80% | 33.41% | 24.18% | 23.55% | 19.28% | 15.65% | 20.36% |
| Annual Growth Operating Margin | | | 0.10% | 4.42% | 0.91% | 13.14% | 38.20% | 2.67% | 22.14% | 23.15% | -23.11% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 45.8% | 49.31% | 49.65% | 47.77% | 46.32% | 38.64% | 30.46% | 32.66% | 32.28% | 29.97% | 33.83% |
| Annual Growth EBITDA Margin | | | -0.69% | 3.94% | 3.13% | 19.87% | 26.86% | -6.73% | 1.16% | 7.73% | -11.42% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 36.5% | 11.38% | 11.82% | 10.94% | 11.29% | 10.50% | 8.89% | 6.75% | 9.16% | 6.37% | 8.34% |
| Annual Growth RONA b.I.a.T. | | | -3.70% | 8.10% | -3.12% | 7.52% | 18.14% | 31.66% | -26.32% | 43.89% | -23.64% | base year |
| EBITDA per WLU | EBITDA / WLUs | 21.2% | 6.28 € | 6.11 € | 5.57 € | 4.91 € | 4.19 € | 3.72 € | 4.64 € | 5.01 € | 5.01 € | 5.18 € |
| Inflation-Adjusted EBITDA per WLU | | -5.7% | 5.66 € | 5.59 € | 5.27 € | 4.79 € | 4.19 € | 3.84 € | 4.89 € | 5.37 € | 5.54 € | 6.00 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 124.6% | 32.44% | 28.30% | 28.51% | 26.48% | 23.34% | 17.74% | 15.09% | 11.94% | 35.41% | 14.44% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 56.6% | 9.26% | 8.40% | 8.17% | 7.91% | 7.33% | 6.52% | 4.33% | 5.67% | 14.40% | 5.91% |
| Annual Growth ROE (Shareh. Funds) | | | 10.29% | 2.75% | 3.38% | 7.82% | 12.45% | 50.77% | -23.75% | -60.61% | 143.51% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 1.3% | 29.80% | 22.39% | 20.43% | 17.84% | 17.50% | 17.86% | 13.23% | 34.07% | 31.31% | 29.42% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 1.8% | 42.45% | 28.85% | 25.68% | 21.72% | 21.21% | 21.74% | 15.25% | 51.67% | 45.57% | 41.69% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -44.6% | 0.205 | 0.253 | 0.251 | 0.254 | 0.293 | 0.362 | 0.276 | 0.437 | 0.379 | 0.371 |

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -0.5% | 70.20% | 77.61% | 79.57% | 82.16% | 82.50% | 82.14% | 86.77% | 65.93% | 68.69% | 70.58% |
| Financial Leverage | Total Assets / Shareh. Funds | 0.5% | 142.45% | 128.85% | 125.68% | 121.72% | 121.21% | 121.74% | 115.25% | 151.67% | 145.57% | 141.69% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 208.2% | 19,416 € | 16,430 € | 14,569 € | 11,062 € | 8,757 € | 6,689 € | 5,138 € | 5,800 € | 11,213 € | 6,299 € |
| Annual Growth Cash Flow | | | 18.17% | 12.77% | 31.71% | 26.32% | 30.92% | 30.18% | -11.41% | -48.28% | 78.01% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 24.8% | 5.33 € | 4.69 € | 4.45 € | 3.71 € | 3.10 € | 2.93 € | 3.44 € | 3.87 € | 8.31 € | 4.27 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 50.1% | 41.88% | 38.12% | 38.14% | 35.00% | 28.57% | 24.02% | 24.20% | 24.94% | 49.72% | 27.91% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -88.6% | 0.354 | 0.818 | 5.472 | 0.536 | 0.810 | 2.017 | 2.212 | 3.911 | 6.507 | 3.110 |
| Tax Rate | Taxes Paid / EBT | -4.7% | 27.41% | 30.22% | 23.29% | 29.38% | 32.93% | 28.66% | 31.93% | 37.03% | 33.04% | 28.77% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -30.3% | 0.286 | 0.297 | 0.287 | 0.299 | 0.314 | 0.368 | 0.287 | 0.475 | 0.407 | 0.410 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -14,601 € | -35,498 € | -3,655 € | 11,906 € | -9,565 € | -2,057 € | 3,372 € | 2,815 € | 4,317 € | 9,490 € | 4,274 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 1447.7% | 24.76 € | 9.39 € | 1.42 € | 11.31 € | 5.72 € | 2.05 € | 1.97 € | 1.16 € | 1.48 € | 1.60 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 1104.4% | 22.30 € | 8.59 € | 1.34 € | 11.04 € | 5.72 € | 2.12 € | 2.08 € | 1.25 € | 1.64 € | 1.85 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 1220.1% | 118.46% | 46.60% | 6.97% | 65.25% | 35.27% | 11.91% | 10.94% | 6.38% | 7.64% | 8.97% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 1783.2% | 12.546 | 4.744 | 0.724 | 7.660 | 6.746 | 1.896 | 1.201 | 0.490 | 0.534 | 0.666 |

## FRA – Frankfurt, Germany

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 19.7% | 19.35% | 18.07% | 15.47% | 15.60% | 10.14% | 10.55% | 10.62% | 7.81% | 11.95% | 16.16% |
| Annual Growth Operating Margin | | | 7.07% | 16.82% | -0.82% | 53.81% | -3.91% | -0.68% | 36.05% | -34.64% | -26.07% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 8.9% | 32.98% | 35.01% | 33.11% | 34.53% | 33.98% | 34.81% | 24.16% | 21.92% | 25.49% | 30.27% |
| Annual Growth EBITDA Margin | | | -5.79% | 5.72% | -4.09% | 1.61% | -2.38% | 44.10% | 10.21% | -14.03% | -15.78% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -6.3% | 38.87% | 37.31% | 31.89% | 33.02% | 22.52% | 23.41% | 36.67% | 26.11% | 34.84% | 41.47% |
| Annual Growth RONA b.I.a.T. | | | 4.18% | 16.96% | -3.41% | 46.64% | -3.80% | -36.17% | 40.46% | -25.06% | -15.99% | base year |
| EBITDA per WLU | EBITDA / WLUs | 30.1% | 7.61 € | 8.17 € | 7.59 € | 8.36 € | 8.37 € | 8.73 € | 5.89 € | 4.95 € | 5.63 € | 5.85 € |
| Inflation-Adjusted EBITDA per WLU | | 3.9% | 7.25 € | 7.83 € | 7.35 € | 8.24 € | 8.37 € | 8.88 € | 6.15 € | 5.41 € | 6.45 € | 6.98 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 3089.8% | 5.03% | 3.97% | 3.60% | 3.45% | 1.82% | 1.51% | 1.26% | -1.43% | -1.65% | 0.16% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 2397.4% | 10.10% | 8.20% | 7.43% | 7.30% | 4.05% | 3.35% | 4.34% | -4.78% | -4.80% | 0.40% |
| Annual Growth ROE (Shareh. Funds) | | | 23.17% | 10.37% | 1.88% | 80.09% | 20.82% | -22.80% | 190.77% | 0.34% | -1286.67% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -11.1% | 70.36% | 70.56% | 71.08% | 71.40% | 73.61% | 75.53% | 86.42% | 85.78% | 83.12% | 79.11% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -37.3% | 237.40% | 239.67% | 245.82% | 249.69% | 278.87% | 308.63% | 636.33% | 603.26% | 492.35% | 378.77% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 8.3% | 0.657 | 0.667 | 0.653 | 0.664 | 0.648 | 0.598 | 0.507 | 0.527 | 0.564 | 0.606 |

## FRA – Frankfurt, Germany

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 41.9% | 29.64% | 29.44% | 28.92% | 28.60% | 26.39% | 24.47% | 13.58% | 14.22% | 16.88% | 20.89% |
| Financial Leverage | Total Assets / Shareh. Funds | -29.5% | 337.40% | 339.67% | 345.82% | 349.69% | 378.87% | 408.63% | 736.33% | 703.26% | 592.35% | 478.77% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 130.0% | 261,742 € | 277,072 € | 267,161 € | 287,521 € | 329,263 € | 313,617 € | 162,004 € | 122,014 € | 103,547 € | 113,818 € |
| Annual Growth Cash Flow | | | -5.53% | 3.71% | -7.08% | -12.68% | 4.99% | 93.59% | 32.78% | 17.84% | -9.02% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 56.2% | 4.30 € | 4.88 € | 4.87 € | 5.42 € | 6.32 € | 6.46 € | 3.60 € | 2.87 € | 2.63 € | 2.76 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 30.8% | 18.66% | 20.91% | 21.25% | 22.38% | 25.66% | 25.77% | 14.79% | 12.68% | 11.90% | 14.26% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 86.1% | 0.685 | 0.900 | 0.888 | 1.244 | 1.295 | 0.945 | 0.396 | 0.287 | 0.305 | 0.368 |
| Tax Rate | Taxes Paid / EBT | 511.5% | 60.46% | 64.42% | 63.50% | 66.53% | 58.97% | 64.72% | 67.20% | 67.91% | -2.76% | 9.89% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -21.7% | 2.009 | 2.065 | 2.062 | 2.117 | 2.221 | 2.218 | 3.452 | 3.343 | 2.916 | 2.566 |
| Owner Earnings (in '000) | Cash Fl. – Investm. | Σ 90-99 -1,053,611 € | -120,265 € | -30,859 € | -33,533 € | 56,432 € | 74,915 € | -18,319 € | -247,022 € | -303,658 € | -236,053 € | -195,250 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -21.9% | 8.41 € | 7.31 € | 7.58 € | 6.06 € | 6.78 € | 9.62 € | 12.80 € | 14.10 € | 12.41 € | 10.77 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -37.6% | 8.02 € | 7.01 € | 7.34 € | 5.98 € | 6.78 € | 9.79 € | 13.38 € | 15.40 € | 14.24 € | 12.85 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -29.7% | 27.23% | 23.24% | 23.92% | 17.98% | 19.82% | 27.27% | 37.34% | 44.23% | 39.03% | 38.74% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -27.2% | 1.998 | 1.372 | 1.355 | 0.950 | 0.832 | 1.124 | 2.760 | 3.135 | 2.881 | 2.746 |

## GLA – Glasgow, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 5.2% | 37.32% | 37.30% | 34.16% | 28.27% | 29.25% | 30.87% | 36.21% | 31.10% | 31.11% | 35.47% |
| Annual Growth Operating Margin | | | 0.06% | 9.20% | 20.83% | -3.35% | -5.26% | -14.75% | 16.44% | -0.02% | -12.31% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 18.8% | 49.99% | 50.32% | 48.10% | 41.49% | 42.65% | 40.29% | 43.82% | 38.23% | 39.78% | 42.09% |
| Annual Growth EBITDA Margin | | | -0.66% | 4.60% | 15.94% | -2.72% | 5.86% | -8.07% | 14.61% | -3.90% | -5.48% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 16.7% | 27.87% | 33.82% | 32.70% | 28.01% | 28.05% | 37.98% | 43.61% | 38.54% | 29.48% | 23.87% |
| Annual Growth RONA b.I.a.T. | | | -17.61% | 3.43% | 16.75% | -0.12% | -26.16% | -12.90% | 13.16% | 30.74% | 23.47% | base year |
| EBITDA per WLU | EBITDA / WLUs | 22.1% | 7.47 € | 7.28 € | 7.13 € | 6.16 € | 5.81 € | 6.35 € | 7.26 € | 5.76 € | 6.26 € | 6.12 € |
| Inflation-Adjusted EBITDA per WLU | | -5.5% | 6.74 € | 6.67 € | 6.73 € | 6.02 € | 5.81 € | 6.56 € | 7.70 € | 6.22 € | 6.96 € | 7.13 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -27.5% | 19.41% | 15.94% | 5.44% | 13.22% | 10.00% | 21.83% | 25.96% | 17.45% | 24.76% | 26.76% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -19.5% | 14.49% | 14.46% | 5.21% | 13.10% | 9.59% | 26.86% | 31.27% | 21.63% | 23.47% | 18.01% |
| Annual Growth ROE (Shareh. Funds) | | | 0.26% | 177.69% | -60.27% | 36.65% | -64.30% | -14.09% | 44.57% | -7.84% | 30.30% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 50.0% | 62.48% | 65.77% | 68.56% | 68.75% | 70.14% | 73.65% | 69.50% | 67.87% | 61.18% | 41.64% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 133.4% | 166.55% | 192.18% | 218.02% | 220.03% | 234.85% | 279.46% | 227.88% | 211.28% | 157.59% | 71.36% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -24.4% | 0.313 | 0.324 | 0.312 | 0.320 | 0.295 | 0.338 | 0.385 | 0.422 | 0.385 | 0.414 |

## GLA – Glasgow, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -35.7% | 37.52% | 34.23% | 31.44% | 31.25% | 29.86% | 26.35% | 30.50% | 32.13% | 38.82% | 58.36% |
| Financial Leverage | Total Assets / Shareh. Funds | 55.6% | 266.55% | 292.18% | 318.02% | 320.03% | 334.85% | 379.46% | 327.88% | 311.28% | 257.59% | 171.36% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 51.2% | 33,150 € | 27,986 € | 17,943 € | 22,258 € | 18,137 € | 27,968 € | 29,482 € | 18,315 € | 23,422 € | 21,918 € |
| Annual Growth Cash Flow | | | 18.45% | 55.97% | -19.39% | 22.72% | -35.15% | -5.14% | 60.98% | -21.81% | 6.86% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -1.2% | 4.79 € | 4.19 € | 2.87 € | 3.93 € | 3.19 € | 4.93 € | 5.56 € | 3.71 € | 5.26 € | 4.85 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -3.9% | 32.07% | 28.96% | 19.38% | 26.44% | 23.40% | 31.25% | 33.57% | 24.59% | 33.44% | 33.38% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 175.4% | 1.467 | 1.575 | 1.540 | 3.551 | 1.581 | 0.518 | 0.637 | 0.776 | 0.464 | 0.533 |
| Tax Rate | Taxes Paid / EBT | -5.1% | 23.30% | 27.14% | 13.20% | -4.82% | 16.44% | 11.83% | 18.57% | 22.66% | 16.95% | 24.56% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 10.9% | 0.747 | 0.907 | 0.957 | 0.991 | 0.959 | 1.230 | 1.204 | 1.239 | 0.948 | 0.673 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -44,754 € | 10,553 € | 10,213 € | 6,289 € | 15,990 € | 6,664 € | -26,051 € | -16,817 € | -5,283 € | -27,085 € | -19,227 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -65.6% | 3.33 € | 2.71 € | 1.91 € | 1.14 € | 2.08 € | 9.91 € | 9.14 € | 4.99 € | 11.90 € | 9.67 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -73.4% | 3.00 € | 2.48 € | 1.80 € | 1.11 € | 2.08 € | 10.23 € | 9.70 € | 5.38 € | 13.24 € | 11.27 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -65.1% | 21.86% | 18.39% | 12.59% | 7.45% | 14.80% | 60.35% | 52.72% | 31.68% | 72.11% | 62.66% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -81.8% | 1.726 | 1.413 | 0.903 | 0.563 | 1.105 | 6.410 | 6.929 | 4.440 | 8.310 | 9.467 |

## GVA – Geneva, Switzerland

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 14.9% | 17.85% | 11.63% | 18.56% | 19.91% | 18.39% | 15.40% | 15.91% | 16.88% | 14.34% | 15.53% |
| Annual Growth Operating Margin | | | 53.44% | -37.32% | -6.78% | 8.28% | 19.37% | -3.19% | -5.72% | 17.69% | -7.66% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 3.0% | 36.22% | 34.42% | 33.80% | 34.84% | 37.06% | 29.53% | 31.15% | 32.81% | 32.09% | 35.18% |
| Annual Growth EBITDA Margin | | | 5.23% | 1.84% | -2.98% | -5.98% | 25.47% | -5.18% | -5.06% | 2.24% | -8.78% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 94-99 -87.8% | 93.41% | 29.55% | 190.39% | 318.99% | 266.26% | 764.58% | n/a | n/a | n/a | n/a |
| Annual Growth RONA b.I.a.T. | | | 216.12% | -84.48% | -40.31% | 19.81% | -65.18% | base year | n/a | n/a | n/a | n/a |
| EBITDA per WLU | EBITDA / WLUs | 28.9% | 5.09 € | 4.79 € | 4.71 € | 5.10 € | 5.19 € | 3.97 € | 3.92 € | 4.01 € | 3.91 € | 3.95 € |
| Inflation-Adjusted EBITDA per WLU | | 7.9% | 4.98 € | 4.72 € | 4.65 € | 5.06 € | 5.19 € | 4.05 € | 4.03 € | 4.26 € | 4.32 € | 4.62 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -1321.2% | -13.32% | 10.16% | 4.73% | 2.36% | 5.95% | 2.01% | 0.73% | 1.36% | 0.80% | 1.09% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 94-99 -169.7% | -69.71% | 25.81% | 48.49% | 37.87% | 86.18% | 100.00% | n/a | n/a | n/a | n/a |
| Annual Growth ROE (Shareh. Funds) | | | -370.09% | -46.77% | 28.02% | -56.05% | -13.82% | base year | n/a | n/a | n/a | n/a |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 93-99 -13.4% | 86.61% | 72.47% | 90.91% | 93.31% | 92.31% | 96.77% | 100.00% | n/a | n/a | n/a |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 94-99 -78.4% | 646.87% | 263.23% | 1000.02% | 1394.47% | 1200.96% | 2993.17% | n/a | n/a | n/a | n/a |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 93-99 -96.1% | 0.958 | 1.284 | 2.816 | 3.320 | 7.324 | 42.959 | 24.281 | n/a | n/a | n/a |

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 94-99 314.2% | 13.39% | 27.53% | 9.09% | 6.69% | 7.69% | 3.23% | 0.00% | n/a | n/a | n/a |
| Financial Leverage | Total Assets / Shareh. Funds | 94-99 -75.9% | 746.87% | 363.23% | 1100.02% | 1494.47% | 1300.96% | 3093.17% | n/a | n/a | n/a | n/a |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | -63.7% | 5,257 € | 32,046 € | 18,836 € | 17,048 € | 23,574 € | 14,293 € | 12,568 € | 12,689 € | 13,058 € | 14,468 € |
| Annual Growth Cash Flow | | | -83.60% | 70.13% | 10.49% | -27.68% | 64.93% | 13.73% | -0.96% | -2.83% | -9.75% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -69.5% | 0.71 € | 4.58 € | 2.78 € | 2.53 € | 3.45 € | 2.17 € | 2.01 € | 2.12 € | 2.26 € | 2.33 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -75.7% | 5.05% | 32.95% | 19.97% | 17.29% | 24.62% | 16.14% | 15.97% | 17.29% | 18.55% | 20.74% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 95-99 -91.6% | 0.155 | 1.484 | 2.088 | 0.865 | 1.857 | n/a | n/a | n/a | n/a | n/a |
| Tax Rate | Taxes Paid / EBT | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 94-99 -89.5% | 5.233 | 2.540 | 10.258 | 16.022 | 14.480 | 49.635 | n/a | n/a | n/a | n/a |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 95-99 -130 € | -28,617 € | 10,447 € | 9,814 € | -2,657 € | 10,883 € | n/a | n/a | n/a | n/a | n/a |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 95-99 134.4% | 4.92 € | 3.39 € | 1.49 € | 3.28 € | 2.10 € | n/a | n/a | n/a | n/a | n/a |
| Infl.-Adj. Capital Exp. per Term. PAX | 95-99 = 129.4% | | 4.81 € | 3.34 € | 1.48 € | 3.26 € | 2.10 € | n/a | n/a | n/a | n/a | n/a |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 95-99 145.5% | 32.54% | 22.21% | 9.56% | 19.99% | 13.25% | n/a | n/a | n/a | n/a | n/a |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 95-99 149.4% | 1.771 | 0.975 | 0.628 | 1.339 | 0.710 | n/a | n/a | n/a | n/a | n/a |

## HAJ – Hanover, Germany

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -58.7% | 4.92% | 4.44% | 19.09% | 21.27% | 20.00% | 21.61% | 19.24% | 10.20% | 21.07% | 11.92% |
| Annual Growth Operating Margin | | | 10.89% | -76.76% | -10.26% | 6.36% | -7.44% | 12.31% | 88.67% | -51.61% | 76.79% | base year |
| EBITDA Margin | EBITDA / Total Revenue | -53.2% | 23.78% | 21.05% | 30.43% | 34.72% | 34.29% | 35.57% | 35.33% | 25.45% | 34.68% | 50.84% |
| Annual Growth EBITDA Margin | | | 12.98% | -30.83% | -12.37% | 1.27% | -3.61% | 0.67% | 38.82% | -26.61% | -31.78% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -66.9% | 7.10% | 5.62% | 23.92% | 26.19% | 24.88% | 29.28% | 26.32% | 15.45% | 28.82% | 21.42% |
| Annual Growth RONA b.I.a.T. | | | 26.42% | -76.52% | -8.68% | 5.26% | -15.02% | 11.23% | 70.42% | -46.40% | 34.55% | base year |
| EBITDA per WLU | EBITDA / WLUs | -54.5% | 5.69 € | 4.97 € | 7.43 € | 8.29 € | 7.55 € | 8.02 € | 7.65 € | 5.06 € | 6.72 € | 12.51 € |
| Inflation-Adjusted EBITDA per WLU | | -63.6% | 5.43 € | 4.77 € | 7.19 € | 8.18 € | 7.55 € | 8.15 € | 7.99 € | 5.52 € | 7.71 € | 14.93 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -233.2% | -6.05% | -4.51% | 5.72% | 7.36% | 7.01% | 8.50% | 5.95% | 0.30% | 6.48% | 4.54% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -207.0% | -8.72% | -5.71% | 7.16% | 9.06% | 8.72% | 11.52% | 8.15% | 0.46% | 8.87% | 8.15% |
| Annual Growth ROE (Shareh. Funds) | | | -52.66% | -179.78% | -20.94% | 3.83% | -24.28% | 41.41% | 1674.94% | -94.82% | 8.76% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 21.4% | 77.36% | 74.93% | 70.28% | 67.19% | 63.42% | 58.25% | 63.17% | 67.44% | 64.17% | 63.70% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 94.7% | 341.68% | 298.81% | 236.43% | 204.75% | 173.41% | 139.51% | 171.55% | 207.17% | 179.13% | 175.51% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -50.3% | 0.342 | 0.336 | 0.397 | 0.449 | 0.483 | 0.594 | 0.567 | 0.529 | 0.516 | 0.690 |

## HAJ – Hanover, Germany

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -37.6% | 22.64% | 25.07% | 29.72% | 32.81% | 36.58% | 41.75% | 36.83% | 32.56% | 35.83% | 36.30% |
| Financial Leverage | Total Assets / Shareh. Funds | 60.3% | 441.68% | 398.81% | 336.43% | 304.75% | 273.41% | 239.51% | 271.55% | 307.17% | 279.13% | 275.51% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | -49.9% | 15,815 € | 14,099 € | 20,313 € | 22,594 € | 20,596 € | 20,412 € | 17,118 € | 10,180 € | 12,012 € | 31,575 € |
| Annual Growth Cash Flow | | | 12.17% | -30.59% | -10.09% | 9.70% | 0.90% | 19.24% | 68.16% | -15.26% | -61.96% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -71.3% | 3.07 € | 2.86 € | 4.16 € | 4.97 € | 4.69 € | 5.06 € | 4.77 € | 3.09 € | 3.90 € | 10.69 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -70.5% | 12.81% | 12.09% | 17.05% | 20.80% | 21.30% | 22.46% | 22.05% | 15.56% | 20.09% | 43.45% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -46.4% | 0.473 | 0.210 | 0.248 | 0.319 | 0.345 | 0.821 | 0.871 | 0.598 | 0.652 | 0.882 |
| Tax Rate | Taxes Paid / EBT | -78.8% | 10.42% | -14.84% | 51.32% | 47.00% | 46.56% | 44.01% | 47.12% | 82.82% | 51.96% | 49.22% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -19.7% | 1.443 | 1.265 | 1.253 | 1.231 | 1.244 | 1.355 | 1.368 | 1.515 | 1.367 | 1.797 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -244,231 € | -17,653 € | -53,057 € | -61,690 € | -48,303 € | -39,083 € | -4,440 € | -2,528 € | -6,857 € | -6,413 € | -4,208 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -49.0% | 6.68 € | 14.14 € | 17.57 € | 16.46 € | 14.45 € | 6.56 € | 5.85 € | 5.61 € | 6.50 € | 13.10 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -59.2% | 6.37 € | 13.56 € | 17.01 € | 16.24 € | 14.45 € | 6.67 € | 6.11 € | 6.12 € | 7.46 € | 15.63 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -44.9% | 27.11% | 57.61% | 68.84% | 65.28% | 61.71% | 27.35% | 25.30% | 26.04% | 30.82% | 49.25% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 13.6% | 1.438 | 3.469 | 6.072 | 4.854 | 4.320 | 1.959 | 1.572 | 1.707 | 2.265 | 1.265 |

## HAM – Hamburg, Germany

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 239.1% | 26.58% | 26.24% | 26.59% | 21.47% | 25.64% | 16.06% | 0.37% | 11.42% | 6.23% | 7.84% |
| Annual Growth Operating Margin | | | 1.31% | -1.33% | 23.84% | -16.27% | 59.70% | 4215.15% | -96.74% | 83.25% | -20.48% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 47.9% | 37.58% | 36.23% | 37.86% | 37.56% | 42.30% | 37.74% | 35.78% | 29.67% | 26.63% | 25.41% |
| Annual Growth EBITDA Margin | | | 3.72% | -4.30% | 0.79% | -11.21% | 12.10% | 5.48% | 20.58% | 11.41% | 4.79% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 122.8% | 54.93% | 57.02% | 56.16% | 81.54% | 77.14% | 55.64% | 1.45% | 47.06% | 19.80% | 24.65% |
| Annual Growth RONA b.I.a.T. | | | -3.67% | 1.54% | -31.13% | 5.71% | 38.64% | 3735.88% | -96.92% | 137.67% | -19.67% | base year |
| EBITDA per WLU | EBITDA / WLUs | 88.3% | 7.32 € | 7.17 € | 7.29 € | 7.52 € | 8.60 € | 7.60 € | 6.97 € | 5.37 € | 4.54 € | 3.89 € |
| Inflation-Adjusted EBITDA per WLU | | 50.4% | 6.98 € | 6.87 € | 7.05 € | 7.42 € | 8.60 € | 7.73 € | 7.28 € | 5.86 € | 5.21 € | 4.64 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | 397.5% | 15.34% | 12.44% | 11.23% | 13.46% | 6.02% | 4.88% | 3.22% | -3.88% | 1.46% | 3.08% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 227.0% | 31.71% | 27.04% | 23.71% | 51.13% | 18.12% | 16.90% | 12.55% | -15.96% | 4.65% | 9.70% |
| Annual Growth ROE (Shareh. Funds) | | | 17.28% | 14.01% | -53.62% | 182.19% | 7.18% | 34.68% | 178.63% | -443.44% | -52.06% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -29.4% | 57.22% | 59.09% | 62.90% | 80.56% | 77.79% | 81.69% | 84.74% | 86.76% | 83.46% | 81.06% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -68.7% | 133.76% | 144.42% | 169.55% | 414.31% | 350.35% | 446.20% | 555.11% | 655.48% | 504.77% | 428.00% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 35.9% | 1.004 | 1.054 | 1.009 | 0.940 | 0.880 | 0.748 | 0.657 | 0.601 | 0.615 | 0.738 |

## HAM – Hamburg, Germany

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 125.9% | 42.78% | 40.91% | 37.10% | 19.44% | 22.21% | 18.31% | 15.26% | 13.24% | 16.54% | 18.94% |
| Financial Leverage | Total Assets / Shareh. Funds | -55.7% | 233.76% | 244.42% | 269.55% | 514.31% | 450.35% | 546.20% | 655.11% | 755.48% | 604.77% | 528.00% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 121.1% | 50,821 € | 42,189 € | 39,331 € | 51,466 € | 40,162 € | 43,902 € | 59,067 € | 19,261 € | 25,920 € | 22,985 € |
| Annual Growth Cash Flow | | | 20.46% | 7.27% | -23.58% | 28.15% | -8.52% | -25.67% | 206.67% | -25.69% | 12.77% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 62.4% | 5.13 € | 4.44 € | 4.33 € | 5.92 € | 4.61 € | 5.35 € | 7.52 € | 2.60 € | 3.73 € | 3.16 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 27.5% | 26.34% | 22.43% | 22.49% | 29.55% | 22.68% | 26.56% | 38.62% | 14.37% | 21.86% | 20.66% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 271.0% | 1.517 | 1.715 | 2.703 | 3.381 | 2.131 | 1.958 | 0.652 | 0.309 | 0.391 | 0.409 |
| Tax Rate | Taxes Paid / EBT | -16.1% | 50.66% | 46.29% | 41.08% | 6.89% | 45.63% | 17.19% | 195.91% | -14.87% | 67.19% | 60.35% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -34.3% | 2.067 | 2.173 | 2.112 | 3.797 | 3.008 | 3.465 | 3.898 | 4.120 | 3.176 | 3.144 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -9,352 € | 17,318 € | 17,596 € | 24,781 € | 36,243 € | 21,318 € | 21,475 € | -31,472 € | -43,011 € | -40,371 € | -33,229 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -57.5% | 3.57 € | 2.73 € | 1.70 € | 1.87 € | 2.32 € | 2.95 € | 12.46 € | 9.14 € | 10.36 € | 8.40 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -66.0% | 3.41 € | 2.62 € | 1.65 € | 1.85 € | 2.32 € | 3.00 € | 13.02 € | 9.98 € | 11.89 € | 10.02 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -65.6% | 17.36% | 13.08% | 8.32% | 8.74% | 10.64% | 13.57% | 59.20% | 46.46% | 55.91% | 50.52% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -45.1% | 1.579 | 1.308 | 0.739 | 0.543 | 0.639 | 0.626 | 1.672 | 2.546 | 2.741 | 2.875 |

## LBA – Leeds Bradford, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -5.7% | 25.01% | 25.85% | 22.31% | 14.24% | 5.99% | 11.49% | 18.80% | 14.87% | 17.67% | 26.53% |
| Annual Growth Operating Margin | | | -3.26% | 15.88% | 56.66% | 137.80% | -47.89% | -38.85% | 26.42% | -15.86% | -33.38% | base year |
| EBITDA Margin | EBITDA / Total Revenue | -4.9% | 37.44% | 38.85% | 35.81% | 29.15% | 20.56% | 25.17% | 31.47% | 28.25% | 31.82% | 39.38% |
| Annual Growth EBITDA Margin | | | -3.64% | 8.49% | 22.85% | 41.74% | -18.28% | -20.05% | 11.42% | -11.21% | -19.21% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 9.5% | 13.68% | 15.38% | 12.57% | 7.47% | 2.83% | 5.09% | 8.27% | 6.60% | 7.45% | 12.50% |
| Annual Growth RONA b.I.a.T. | | | -11.02% | 22.39% | 68.22% | 164.00% | -44.40% | -38.51% | 25.30% | -11.36% | -40.39% | base year |
| EBITDA per WLU | EBITDA / WLUs | 0.8% | 6.53 € | 6.57 € | 5.64 € | 3.96 € | 2.68 € | 3.66 € | 5.03 € | 4.71 € | 5.65 € | 6.47 € |
| Inflation-Adjusted EBITDA per WLU | | -22.0% | 5.89 € | 6.02 € | 5.33 € | 3.86 € | 2.68 € | 3.78 € | 5.33 € | 5.08 € | 6.29 € | 7.54 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -25.0% | 16.33% | 17.33% | 15.02% | 7.87% | 1.05% | 6.07% | 10.74% | 10.31% | 14.11% | 21.77% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -12.9% | 8.94% | 10.31% | 8.46% | 4.13% | 0.49% | 2.69% | 4.73% | 4.58% | 5.95% | 10.26% |
| Annual Growth ROE (Shareh. Funds) | | | -13.30% | 21.87% | 104.87% | 735.96% | -81.61% | -43.20% | 3.29% | -23.04% | -42.03% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -6.8% | 33.36% | 33.89% | 37.11% | 35.05% | 34.74% | 35.68% | 34.18% | 35.17% | 35.83% | 35.81% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -10.3% | 50.07% | 51.27% | 59.00% | 53.96% | 53.24% | 55.48% | 51.94% | 54.26% | 55.84% | 55.79% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 0.1% | 0.462 | 0.517 | 0.470 | 0.431 | 0.371 | 0.354 | 0.401 | 0.412 | 0.397 | 0.462 |

## LBA – Leeds Bradford, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 3.8% | 66.64% | 66.11% | 62.89% | 64.95% | 65.26% | 64.32% | 65.82% | 64.83% | 64.17% | 64.19% |
| Financial Leverage | Total Assets / Shareh. Funds | -3.7% | 150.07% | 151.27% | 159.00% | 153.96% | 153.24% | 155.48% | 151.94% | 154.26% | 155.84% | 155.79% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 67.4% | 7,406 € | 7,250 € | 5,857 € | 3,454 € | 1,910 € | 2,380 € | 2,825 € | 2,755 € | 3,340 € | 4,425 € |
| Annual Growth Cash Flow | | | 2.15% | 23.78% | 69.59% | 80.86% | -19.76% | -15.76% | 2.55% | -17.51% | -24.53% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -11.9% | 5.01 € | 5.13 € | 4.49 € | 3.09 € | 2.04 € | 2.87 € | 3.74 € | 3.95 € | 5.02 € | 5.69 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -17.0% | 28.76% | 30.32% | 28.52% | 22.78% | 15.62% | 19.74% | 23.42% | 23.69% | 28.25% | 34.63% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -85.5% | 0.767 | 1.182 | 1.012 | 1.593 | 0.736 | 0.358 | 0.811 | 1.161 | 0.915 | 5.282 |
| Tax Rate | Taxes Paid / EBT | -4.8% | 30.92% | 30.17% | 27.75% | 28.78% | 48.06% | 40.19% | 34.91% | 34.13% | 34.27% | 32.46% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 16.1% | 0.547 | 0.595 | 0.563 | 0.525 | 0.472 | 0.443 | 0.440 | 0.444 | 0.422 | 0.471 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90/99 -1,727 € | -2,252 € | 1,116 € | 68 € | 1,286 € | -684 € | -4,260 € | -657 € | 381 € | -312 € | 3,588 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 503.3% | 6.55 € | 4.35 € | 4.46 € | 1.96 € | 2.80 € | 8.15 € | 4.73 € | 3.46 € | 5.52 € | 1.09 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 367.0% | 5.91 € | 3.99 € | 4.22 € | 1.91 € | 2.80 € | 8.41 € | 5.02 € | 3.73 € | 6.15 € | 1.26 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 472.0% | 37.50% | 25.66% | 28.19% | 14.30% | 21.22% | 55.07% | 28.87% | 20.41% | 30.89% | 6.56% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 491.9% | 3.018 | 1.974 | 2.088 | 0.959 | 1.456 | 4.028 | 2.277 | 1.525 | 2.184 | 0.510 |

## LGW – London Gatwick, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 6.9% | 35.31% | 35.52% | 33.46% | 33.05% | 27.70% | 24.90% | 25.79% | 30.54% | 26.65% | 33.03% |
| Annual Growth Operating Margin | | | -0.59% | 6.14% | 1.25% | 19.31% | 11.26% | -3.46% | -15.57% | 14.60% | -19.31% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 3.7% | 46.39% | 44.22% | 41.64% | 41.46% | 38.39% | 35.73% | 37.06% | 43.81% | 40.25% | 44.73% |
| Annual Growth EBITDA Margin | | | 4.91% | 6.19% | 0.44% | 7.99% | 7.44% | -3.58% | -15.41% | 8.84% | -10.01% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 41.0% | 12.93% | 16.97% | 16.30% | 14.82% | 10.04% | 8.46% | 8.73% | 9.82% | 7.89% | 9.17% |
| Annual Growth RONA b.I.a.T. | | | -23.84% | 4.14% | 9.95% | 47.58% | 18.73% | -3.08% | -11.11% | 24.50% | -13.95% | base year |
| EBITDA per WLU | EBITDA / WLUs | 17.8% | 6.81 € | 7.14 € | 6.77 € | 5.87 € | 4.89 € | 4.69 € | 5.05 € | 5.37 € | 5.46 € | 5.78 € |
| Inflation-Adjusted EBITDA per WLU | | -8.8% | 6.14 € | 6.54 € | 6.39 € | 5.74 € | 4.89 € | 4.84 € | 5.36 € | 5.79 € | 6.08 € | 6.74 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 8.7% | 24.64% | 24.29% | 16.93% | 20.98% | 15.54% | 16.43% | 15.84% | 18.54% | 18.52% | 22.67% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 43.4% | 9.02% | 11.61% | 8.24% | 9.41% | 5.63% | 5.58% | 5.36% | 5.96% | 5.48% | 6.29% |
| Annual Growth ROE (Shareh. Funds) | | | -22.27% | 40.79% | -12.36% | 66.95% | 0.91% | 4.14% | -10.01% | 8.71% | -12.85% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 114.5% | 21.86% | 26.39% | 29.29% | 27.30% | 28.63% | 27.41% | 20.34% | 20.25% | 18.63% | 10.19% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 146.5% | 27.98% | 35.86% | 41.43% | 37.56% | 40.11% | 37.76% | 25.53% | 25.39% | 22.90% | 11.35% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 15.3% | 0.293 | 0.361 | 0.355 | 0.336 | 0.264 | 0.252 | 0.276 | 0.264 | 0.245 | 0.254 |

## LGW – London Gatwick, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -13.0% | 78.14% | 73.61% | 70.71% | 72.70% | 71.37% | 72.59% | 79.66% | 79.75% | 81.37% | 89.81% |
| Financial Leverage | Total Assets / Shareh. Funds | 14.9% | 127.98% | 135.86% | 141.43% | 137.56% | 140.11% | 137.76% | 125.53% | 125.39% | 122.90% | 111.35% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 75.1% | 176,619 € | 173,335 € | 122,909 € | 114,874 € | 85,274 € | 84,265 € | 82,522 € | 85,321 € | 91,459 € | 100,877 € |
| Annual Growth Cash Flow | | | 1.89% | 41.03% | 6.99% | 34.71% | 1.20% | 2.11% | -3.28% | -6.71% | -9.34% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 18.1% | 5.25 € | 5.33 € | 4.08 € | 4.16 € | 3.34 € | 3.58 € | 3.70 € | 3.90 € | 4.36 € | 4.44 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 4.0% | 35.73% | 32.99% | 25.11% | 29.38% | 26.23% | 27.27% | 27.11% | 31.80% | 32.12% | 34.36% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 5.0% | 1.249 | 1.861 | 0.990 | 1.504 | 1.350 | 0.552 | 1.572 | 2.328 | 1.635 | 1.190 |
| Tax Rate | Taxes Paid / EBT | -12.7% | 27.35% | 27.17% | 25.66% | 28.06% | 31.44% | 25.42% | 32.46% | 30.15% | 23.35% | 31.34% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 31.9% | 0.366 | 0.478 | 0.487 | 0.448 | 0.363 | 0.340 | 0.338 | 0.321 | 0.296 | 0.277 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 236,660 € | 35,224 € | 80,169 € | -1,182 € | 38,505 € | 22,095 € | -68,473 € | 30,033 € | 48,666 € | 35,518 € | 16,105 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 12.0% | 4.65 € | 3.15 € | 4.54 € | 3.11 € | 2.75 € | 7.21 € | 2.60 € | 1.84 € | 2.96 € | 4.15 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -13.3% | 4.19 € | 2.89 € | 4.29 € | 3.04 € | 2.75 € | 7.44 € | 2.76 € | 1.99 € | 3.30 € | 4.83 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -1.0% | 28.60% | 17.73% | 25.35% | 19.54% | 19.43% | 49.43% | 17.25% | 13.66% | 19.65% | 28.88% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 4.5% | 2.581 | 2.038 | 3.100 | 2.323 | 1.818 | 4.562 | 1.530 | 1.030 | 1.445 | 2.469 |

## LHR – London Heathrow, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -5.5% | 38.90% | 39.88% | 39.35% | 42.49% | 41.09% | 40.37% | 39.71% | 45.55% | 43.57% | 41.15% |
| Annual Growth Operating Margin | | | -2.45% | 1.34% | -7.39% | 3.41% | 1.79% | 1.66% | -12.82% | 4.54% | 5.89% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 2.9% | 51.33% | 50.28% | 46.36% | 48.14% | 47.28% | 46.48% | 45.77% | 52.73% | 51.35% | 49.89% |
| Annual Growth EBITDA Margin | | | 2.07% | 8.46% | -3.69% | 1.81% | 1.73% | 1.54% | -13.20% | 2.70% | 2.92% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 30.4% | 18.30% | 21.42% | 18.73% | 23.25% | 20.87% | 17.37% | 19.09% | 19.38% | 19.16% | 14.04% |
| Annual Growth RONA b.I.a.T. | | | -14.56% | 14.34% | -19.41% | 11.40% | 20.12% | -8.99% | -1.49% | 1.10% | 36.54% | base year |
| EBITDA per WLU | EBITDA / WLUs | 37.3% | 8.76 € | 8.04 € | 7.57 € | 7.22 € | 6.50 € | 6.44 € | 6.56 € | 6.84 € | 7.32 € | 6.38 € |
| Inflation-Adjusted EBITDA per WLU | | 6.3% | 7.90 € | 7.37 € | 7.15 € | 7.05 € | 6.50 € | 6.65 € | 6.96 € | 7.38 € | 8.14 € | 7.43 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -20.7% | 22.82% | 27.51% | 22.21% | 28.26% | 30.92% | 27.10% | 27.76% | 31.45% | 30.14% | 28.79% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 9.4% | 10.74% | 14.77% | 10.57% | 15.46% | 15.70% | 11.66% | 13.34% | 13.38% | 13.26% | 9.82% |
| Annual Growth ROE (Shareh. Funds) | | | -27.32% | 39.71% | -31.59% | -1.56% | 34.68% | -12.62% | -0.28% | 0.93% | 35.01% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 328.9% | 47.24% | 53.45% | 44.41% | 44.65% | 44.84% | 30.33% | 35.42% | 20.35% | 20.03% | 11.02% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 623.4% | 89.56% | 114.83% | 79.90% | 80.67% | 81.30% | 43.52% | 54.85% | 25.55% | 25.04% | 12.38% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -24.4% | 0.255 | 0.259 | 0.274 | 0.318 | 0.290 | 0.310 | 0.351 | 0.378 | 0.366 | 0.337 |

## LHR – London Heathrow, UK

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -40.7% | 52.76% | 46.55% | 55.59% | 55.35% | 55.16% | 69.67% | 64.58% | 79.65% | 79.97% | 88.98% |
| Financial Leverage | Total Assets / Shareh. Funds | 68.7% | 189.56% | 214.83% | 179.90% | 180.67% | 181.30% | 143.52% | 154.85% | 125.55% | 125.04% | 112.38% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 95.7% | 457,948 € | 448,452 € | 339,329 € | 344,239 € | 337,381 € | 289,179 € | 278,632 € | 271,182 € | 268,731 € | 234,012 € |
| Annual Growth Cash Flow | | | 2.12% | 32.16% | -1.43% | 2.03% | 16.67% | 3.79% | 2.75% | 0.91% | 14.84% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 25.4% | 6.01 € | 6.06 € | 4.77 € | 5.08 € | 5.10 € | 4.60 € | 4.85 € | 5.01 € | 5.40 € | 4.80 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -6.1% | 35.25% | 37.91% | 29.22% | 33.90% | 37.11% | 33.20% | 33.82% | 38.64% | 37.92% | 37.53% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -7.3% | 1.543 | 1.169 | 0.514 | 0.821 | 0.789 | 0.619 | 1.104 | 1.596 | 1.819 | 1.665 |
| Tax Rate | Taxes Paid / EBT | -31.6% | 23.62% | 18.78% | 17.80% | 21.56% | 23.87% | 30.12% | 31.01% | 30.83% | 31.31% | 34.51% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 37.9% | 0.470 | 0.537 | 0.476 | 0.547 | 0.508 | 0.430 | 0.481 | 0.425 | 0.440 | 0.341 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -96,262 € | 161,145 € | 64,690 € | -321,158 € | -75,218 € | -90,064 € | -177,626 € | 26,265 € | 101,267 € | 120,958 € | 93,480 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 39.9% | 4.76 € | 6.29 € | 11.36 € | 7.47 € | 7.80 € | 8.97 € | 5.21 € | 3.72 € | 3.52 € | 3.40 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 8.3% | 4.30 € | 5.76 € | 10.73 € | 7.29 € | 7.80 € | 9.26 € | 5.53 € | 4.02 € | 3.91 € | 3.97 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 1.4% | 22.85% | 32.44% | 56.88% | 41.31% | 47.02% | 53.60% | 30.64% | 24.21% | 20.85% | 22.54% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -28.7% | 1.838 | 3.117 | 8.114 | 7.319 | 7.599 | 8.777 | 5.052 | 3.369 | 2.681 | 2.578 |

## LPL – Liverpool, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 29.3% | -9.99% | -4.83% | -9.05% | -12.55% | -40.24% | -49.92% | -50.09% | -34.71% | -31.02% | -14.14% |
| Annual Growth Operating Margin | | | -106.97% | 46.62% | 27.93% | 68.81% | 19.39% | 0.35% | -44.33% | -11.87% | -119.34% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 702.6% | 2.12% | 5.57% | 2.23% | -3.34% | -28.48% | -38.19% | -37.71% | -23.34% | -19.48% | 0.26% |
| Annual Growth EBITDA Margin | | | -62.01% | 150.26% | 166.67% | 88.27% | 25.44% | -1.28% | -61.57% | -19.82% | -7481.26% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -14.9% | -4.86% | -1.96% | -3.54% | -3.83% | -9.92% | -9.39% | -8.49% | -5.81% | -6.76% | -4.23% |
| Annual Growth RONA b.I.a.T. | | | -148.50% | 44.69% | 7.67% | 61.41% | -5.68% | -10.64% | -45.98% | 13.96% | -59.78% | base year |
| EBITDA per WLU | EBITDA / WLUs | 373.8% | 0.17 € | 0.55 € | 0.20 € | -0.27 € | -2.12 € | -2.86 € | -3.03 € | -2.32 € | -2.55 € | 0.04 € |
| Inflation-Adjusted EBITDA per WLU | | 259.2% | 0.15 € | 0.50 € | 0.19 € | -0.27 € | -2.12 € | -2.96 € | -3.21 € | -2.50 € | -2.85 € | 0.04 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -107.7% | -18.09% | -6.76% | -8.13% | -11.10% | -36.26% | -42.98% | -38.07% | -15.87% | -18.43% | -8.71% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -237.8% | -8.80% | -2.74% | -3.18% | -3.39% | -8.94% | -8.09% | -6.45% | -2.66% | -4.01% | -2.60% |
| Annual Growth ROE (Shareh. Funds) | | | -221.27% | 13.85% | 6.21% | 62.10% | -10.58% | -25.38% | -142.56% | 33.76% | -54.16% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 242.2% | 56.19% | 38.24% | 17.84% | 13.22% | 12.95% | 12.90% | 14.41% | 13.80% | 13.75% | 16.42% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 552.9% | 128.28% | 61.90% | 21.72% | 15.23% | 14.88% | 14.81% | 16.83% | 16.01% | 15.94% | 19.65% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -33.0% | 0.221 | 0.264 | 0.350 | 0.299 | 0.256 | 0.209 | 0.202 | 0.208 | 0.271 | 0.330 |

## LPL – Liverpool, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -47.6% | 43.81% | 61.76% | 82.16% | 86.78% | 87.05% | 87.10% | 85.59% | 86.20% | 86.25% | 83.58% |
| Financial Leverage | Total Assets / Shareh. Funds | 90.8% | 228.28% | 161.90% | 121.72% | 115.23% | 114.88% | 114.81% | 116.83% | 116.01% | 115.94% | 119.65% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | -253.8% | -936 € | 485 € | 406 € | -166 € | -1,760 € | -1,981 € | -1,564 € | -305 € | -655 € | 609 € |
| Annual Growth Cash Flow | | | -293.04% | 19.42% | 344.45% | 90.56% | 11.18% | -26.71% | -411.95% | 53.35% | -207.58% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -161.9% | -0.48 € | 0.36 € | 0.28 € | -0.15 € | -1.82 € | -2.34 € | -2.07 € | -0.45 € | -0.90 € | 0.78 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -204.8% | -5.98% | 3.64% | 3.14% | -1.90% | -24.50% | -31.26% | -25.68% | -4.50% | -6.88% | 5.70% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -128.8% | -0.048 | 0.032 | 0.106 | -0.107 | -4.796 | -3.655 | -7.619 | -2.557 | -0.156 | 0.167 |
| Tax Rate | Taxes Paid / EBT | 0.0% | -0.27% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 62.6% | 0.486 | 0.405 | 0.391 | 0.305 | 0.247 | 0.188 | 0.169 | 0.168 | 0.218 | 0.299 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -54,975 € | -20,393 € | -14,696 € | -3,429 € | -1,716 € | -2,127 € | -2,524 € | -1,769 € | -425 € | -4,863 € | -3,034 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 81.8% | 12.86 € | 16.27 € | 4.26 € | 2.49 € | 0.73 € | 1.23 € | 0.44 € | 0.26 € | 9.03 € | 7.07 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 37.8% | 11.52 € | 14.81 € | 4.01 € | 2.43 € | 0.73 € | 1.27 € | 0.46 € | 0.28 € | 10.08 € | 8.36 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 264.2% | 124.24% | 114.08% | 29.69% | 17.69% | 5.11% | 8.55% | 3.37% | 1.76% | 44.23% | 34.11% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 333.3% | 10.259 | 10.966 | 2.634 | 1.921 | 0.434 | 0.729 | 0.272 | 0.155 | 3.831 | 2.368 |

## LTN – Luton, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-97** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 979.0% | n/a | n/a | 23.13% | 17.78% | 5.43% | 1.99% | -3.18% | 5.39% | 5.83% | 2.14% |
| Annual Growth Operating Margin | | | n/a | n/a | 30.10% | 227.24% | 173.52% | 162.53% | -158.93% | -7.62% | 172.21% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 85.6% | n/a | n/a | 29.60% | 24.98% | 13.97% | 11.29% | 6.45% | 19.39% | 22.08% | 15.95% |
| Annual Growth EBITDA Margin | | | n/a | n/a | 18.50% | 78.81% | 23.77% | 74.94% | -66.71% | -12.18% | 38.36% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 1351.8% | n/a | n/a | 21.08% | 14.92% | 4.14% | 1.35% | -2.02% | 3.31% | 3.60% | 1.45% |
| Annual Growth RONA b.I.a.T. | | | n/a | n/a | 41.26% | 260.55% | 207.04% | 166.60% | -161.23% | -8.25% | 148.10% | base year |
| EBITDA per WLU | EBITDA / WLUs | 115.6% | n/a | n/a | 5.04 € | 3.98 € | 2.46 € | 2.01 € | 1.09 € | 3.16 € | 3.77 € | 2.34 € |
| Inflation-Adjusted EBITDA per WLU | | 74.8% | n/a | n/a | 4.77 € | 3.89 € | 2.46 € | 2.08 € | 1.16 € | 3.41 € | 4.20 € | 2.73 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 226.7% | n/a | n/a | 9.61% | 8.03% | -1.50% | -3.72% | -6.69% | 0.04% | -2.28% | -7.59% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 270.5% | n/a | n/a | 8.76% | 6.74% | -1.15% | -2.52% | -4.26% | 0.02% | -1.41% | -5.14% |
| Annual Growth ROE (Shareh. Funds) | | | n/a | n/a | 29.98% | 688.01% | 54.54% | 40.83% | 18512.97% | 101.64% | 72.56% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 14.5% | n/a | n/a | 42.88% | 42.94% | 43.75% | 42.39% | 43.04% | 39.99% | 38.39% | 37.45% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 25.4% | n/a | n/a | 75.07% | 75.26% | 77.76% | 73.57% | 75.56% | 66.63% | 62.32% | 59.88% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 24.7% | n/a | n/a | 0.618 | 0.559 | 0.463 | 0.420 | 0.425 | 0.442 | 0.458 | 0.496 |

## LTN – Luton, UK

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-97 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -8.7% | n/a | n/a | 57.12% | 57.06% | 56.25% | 57.61% | 56.96% | 60.01% | 61.61% | 62.55% |
| Financial Leverage | Total Assets / Shareh. Funds | 9.5% | n/a | n/a | 175.07% | 175.26% | 177.76% | 173.57% | 175.56% | 166.63% | 162.32% | 159.88% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 281.5% | n/a | n/a | 9,972 € | 6,871 € | 2,507 € | 1,898 € | 994 € | 4,871 € | 5,296 € | 2,614 € |
| Annual Growth Cash Flow | | | n/a | n/a | 45.13% | 174.08% | 32.11% | 90.89% | -79.59% | -8.03% | 102.62% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 200.4% | n/a | n/a | 2.74 € | 2.43 € | 1.24 € | 1.00 € | 0.50 € | 2.29 € | 2.38 € | 0.91 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 158.5% | n/a | n/a | 16.09% | 15.24% | 7.03% | 5.59% | 2.94% | 14.03% | 13.96% | 6.22% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 43.0% | n/a | n/a | 0.879 | 2.291 | 0.456 | 0.263 | 0.216 | 0.665 | 1.373 | 0.615 |
| Tax Rate | Taxes Paid / EBT | 197.7% | n/a | n/a | 34.64% | 34.77% | 0.00% | -26.97% | -27.24% | 0.00% | -4.99% | -35.45% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 34.5% | n/a | n/a | 0.911 | 0.839 | 0.762 | 0.679 | 0.637 | 0.613 | 0.617 | 0.677 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-97 -12,055 € | n/a | n/a | -1,368 € | 3,872 € | -2,994 € | -5,311 € | -3,603 € | -2,454 € | 1,439 € | -1,636 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 99.7% | n/a | n/a | 3.35 € | 1.14 € | 2.92 € | 4.06 € | 2.54 € | 3.88 € | 2.02 € | 1.68 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 61.9% | n/a | n/a | 3.16 € | 1.12 € | 2.92 € | 4.19 € | 2.69 € | 4.19 € | 2.24 € | 1.95 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 80.8% | n/a | n/a | 18.30% | 6.65% | 15.44% | 21.22% | 13.60% | 21.10% | 10.17% | 10.12% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 285.5% | n/a | n/a | 2.825 | 0.923 | 1.808 | 2.281 | 1.412 | 1.508 | 0.626 | 0.733 |

## MAN – Manchester, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -14.7% | 19.55% | 25.12% | 22.40% | 22.37% | 21.95% | 21.47% | 18.44% | 26.49% | 23.02% | 22.91% |
| Annual Growth Operating Margin | | | -22.19% | 12.16% | 0.11% | 1.93% | 2.22% | 16.48% | -30.40% | 15.09% | 0.46% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 7.7% | 40.55% | 45.05% | 41.40% | 42.25% | 42.36% | 38.78% | 36.56% | 39.44% | 37.36% | 37.64% |
| Annual Growth EBITDA Margin | | | -9.98% | 8.83% | -2.01% | -0.26% | 9.22% | 6.09% | -7.30% | 5.55% | -0.75% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -35.1% | 9.12% | 15.36% | 13.48% | 13.71% | 14.13% | 14.19% | 13.77% | 17.97% | 15.30% | 14.05% |
| Annual Growth RONA b.I.a.T. | | | -40.62% | 13.89% | -1.67% | -2.96% | -0.43% | 3.05% | -23.34% | 17.43% | 8.91% | base year |
| EBITDA per WLU | EBITDA / WLUs | 35.9% | 8.46 € | 9.11 € | 8.34 € | 7.22 € | 6.58 € | 6.36 € | 6.19 € | 6.62 € | 6.84 € | 6.22 € |
| Inflation-Adjusted EBITDA per WLU | | 5.2% | 7.63 € | 8.35 € | 7.88 € | 7.05 € | 6.58 € | 6.57 € | 6.56 € | 7.14 € | 7.61 € | 7.25 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | -57.4% | 7.19% | 10.75% | 9.26% | 9.78% | 8.83% | 7.01% | 5.39% | 20.74% | 12.61% | 16.90% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -67.6% | 3.36% | 6.57% | 5.57% | 5.99% | 5.68% | 4.63% | 4.02% | 14.07% | 8.38% | 10.36% |
| Annual Growth ROE (Shareh. Funds) | | | -48.94% | 17.89% | -6.98% | 5.48% | 22.61% | 15.15% | -71.39% | 67.78% | -19.09% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -11.4% | 39.64% | 47.43% | 50.03% | 51.42% | 52.69% | 53.76% | 58.35% | 56.58% | 50.21% | 44.73% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -18.9% | 65.66% | 90.22% | 100.10% | 105.83% | 111.38% | 116.27% | 140.12% | 130.33% | 100.83% | 80.94% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -30.4% | 0.310 | 0.368 | 0.353 | 0.395 | 0.404 | 0.409 | 0.403 | 0.360 | 0.401 | 0.445 |

## MAN – Manchester, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 9.2% | 60.36% | 52.57% | 49.97% | 48.58% | 47.31% | 46.24% | 41.65% | 43.42% | 49.79% | 55.27% |
| Financial Leverage | Total Assets / Shareh. Funds | -8.4% | 165.66% | 190.22% | 200.10% | 205.83% | 211.38% | 216.27% | 240.12% | 230.33% | 200.83% | 180.94% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 92.2% | 109,411 € | 114,477 € | 96,414 € | 78,425 € | 70,768 € | 61,244 € | 55,922 € | 71,528 € | 55,552 € | 56,930 € |
| Annual Growth Cash Flow | | | -4.43% | 18.74% | 22.94% | 10.82% | 15.55% | 9.52% | -21.82% | 28.76% | -2.42% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 12.5% | 5.88 € | 6.20 € | 5.70 € | 5.06 € | 4.54 € | 3.99 € | 3.98 € | 5.66 € | 4.93 € | 5.23 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -10.9% | 28.20% | 30.68% | 28.26% | 29.65% | 29.23% | 24.32% | 23.51% | 33.69% | 26.96% | 31.64% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 127.0% | 1.106 | 0.841 | 0.481 | 0.946 | 1.054 | 1.854 | 1.220 | 0.492 | 0.409 | 0.487 |
| Tax Rate | Taxes Paid / EBT | 16.1% | 39.41% | 35.30% | 35.30% | 31.65% | 36.14% | 45.36% | 40.95% | 11.60% | 34.90% | 33.95% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -23.9% | 0.467 | 0.611 | 0.602 | 0.613 | 0.644 | 0.661 | 0.747 | 0.678 | 0.665 | 0.613 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -291,583 € | 10,450 € | -21,640 € | -103,896 € | -4,448 € | 3,643 € | 28,212 € | 10,070 € | -73,750 € | -80,258 € | -59,966 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -51.0% | 5.67 € | 7.82 € | 12.60 € | 5.66 € | 4.55 € | 2.29 € | 3.49 € | 12.28 € | 12.92 € | 11.58 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -62.1% | 5.11 € | 7.17 € | 11.90 € | 5.53 € | 4.55 € | 2.37 € | 3.70 € | 13.25 € | 14.38 € | 13.49 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -60.7% | 25.51% | 36.48% | 58.71% | 31.33% | 27.73% | 13.12% | 19.28% | 68.43% | 65.91% | 64.96% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -72.5% | 1.214 | 1.830 | 3.090 | 1.577 | 1.359 | 0.758 | 1.064 | 5.285 | 4.594 | 4.409 |

## MRS – Marseille, France

### Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -58.6% | 5.35% | 10.98% | 4.88% | 9.26% | 12.86% | 9.86% | 12.84% | 12.21% | 8.94% | 12.92% |
| Annual Growth Operating Margin | | | -51.29% | 125.07% | -47.29% | -27.98% | 30.33% | -23.20% | 5.23% | 36.56% | -30.80% | base year |
| EBITDA Margin | EBITDA / Total Revenue | -4.3% | 39.95% | 43.08% | 39.12% | 40.76% | 43.43% | 42.27% | 45.14% | 41.84% | 39.35% | 41.76% |
| Annual Growth EBITDA Margin | | | -7.25% | 10.13% | -4.04% | -6.14% | 2.75% | -6.37% | 7.88% | 6.33% | -5.78% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -60.3% | 8.72% | 19.81% | 7.82% | 16.11% | 22.57% | 17.14% | 22.28% | 21.15% | 13.42% | 21.98% |
| Annual Growth RONA b.I.a.T. | | | -56.00% | 153.24% | -51.44% | -28.62% | 31.69% | -23.05% | 5.35% | 57.61% | -38.94% | base year |
| EBITDA per WLU | EBITDA / WLUs | 25.5% | 3.65 € | 4.13 € | 3.35 € | 3.53 € | 3.90 € | 3.61 € | 3.75 € | 3.25 € | 2.90 € | 2.91 € |
| Inflation-Adjusted EBITDA per WLU | | 7.5% | 3.49 € | 3.97 € | 3.25 € | 3.46 € | 3.90 € | 3.67 € | 3.88 € | 3.44 € | 3.13 € | 3.25 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -1860.4% | -4.92% | -5.29% | -8.87% | -7.56% | -5.77% | -9.36% | -6.46% | -11.91% | -6.73% | -0.25% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -1777.3% | -8.01% | -9.53% | -14.23% | -13.15% | -10.12% | -16.26% | -11.21% | -20.63% | -10.11% | -0.43% |
| Annual Growth ROE (Shareh. Funds) | | | 15.95% | 32.98% | -8.17% | -29.90% | 37.75% | -45.11% | 45.67% | -104.07% | -2268.44% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | 4.8% | 76.92% | 79.84% | 79.21% | 78.71% | 78.20% | 79.78% | 79.62% | 81.34% | 77.54% | 73.38% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | 20.9% | 333.33% | 395.98% | 380.90% | 369.79% | 358.62% | 394.49% | 390.59% | 435.93% | 345.18% | 275.68% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -22.2% | 0.463 | 0.437 | 0.412 | 0.485 | 0.512 | 0.485 | 0.464 | 0.416 | 0.439 | 0.595 |

## MRS – Marseille, France

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | -13.3% | 23.08% | 20.16% | 20.79% | 21.29% | 21.80% | 20.22% | 20.38% | 18.66% | 22.46% | 26.62% |
| Financial Leverage | Total Assets / Shareh. Funds | 15.3% | 433.33% | 495.98% | 480.90% | 469.79% | 458.62% | 494.49% | 490.59% | 535.93% | 445.18% | 375.68% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 71.3% | 17,626 € | 15,623 € | 12,877 € | 12,126 € | 12,217 € | 10,226 € | 11,013 € | 6,862 € | 8,133 € | 10,290 € |
| Annual Growth Cash Flow | | | 12.82% | 21.32% | 6.19% | -0.74% | 19.47% | -7.15% | 60.51% | -15.63% | -20.97% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 36.1% | 2.71 € | 2.57 € | 2.17 € | 2.08 € | 2.23 € | 1.97 € | 2.14 € | 1.38 € | 1.74 € | 1.99 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 3.8% | 29.68% | 26.81% | 25.36% | 23.95% | 24.81% | 23.04% | 25.83% | 17.73% | 23.68% | 28.60% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 331.0% | 2.753 | 0.649 | 0.402 | 0.599 | 0.925 | 1.448 | 2.248 | 0.297 | 0.353 | 0.639 |
| Tax Rate | Taxes Paid / EBT | 5362.2% | 4937.79% | 83.95% | 216.31% | 478.14% | 176.66% | 251.53% | 1560.49% | 640.05% | 371.07% | 90.40% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -4.2% | 1.629 | 1.804 | 1.603 | 1.740 | 1.756 | 1.738 | 1.734 | 1.733 | 1.501 | 1.702 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -53,131 € | 11,223 € | -8,433 € | -19,142 € | -8,122 € | -990 € | 3,163 € | 6,114 € | -16,209 € | -14,915 € | -5,820 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -68.6% | 1.08 € | 4.35 € | 6.00 € | 3.90 € | 2.71 € | 1.54 € | 1.08 € | 5.22 € | 5.50 € | 3.45 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -73.1% | 1.04 € | 4.19 € | 5.81 € | 3.82 € | 2.71 € | 1.57 € | 1.12 € | 5.51 € | 5.95 € | 3.85 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -75.9% | 10.78% | 41.28% | 63.06% | 39.99% | 26.82% | 15.92% | 11.49% | 59.61% | 67.10% | 44.77% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -79.9% | 0.312 | 1.286 | 1.842 | 1.269 | 0.877 | 0.491 | 0.356 | 2.011 | 2.206 | 1.552 |

## NAP – Naples, Italy

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 442.6% | 12.18% | 12.62% | 13.11% | 11.40% | 6.99% | -0.52% | 11.07% | 15.58% | 1.77% | 2.25% |
| Annual Growth Operating Margin | | | -3.47% | -3.75% | 15.02% | 63.12% | 1455.56% | -104.66% | -28.91% | 781.13% | -21.29% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 306.9% | 19.95% | 20.76% | 19.73% | 17.19% | 12.35% | 4.11% | 14.56% | 18.57% | 4.81% | 4.90% |
| Annual Growth EBITDA Margin | | | -3.89% | 5.22% | 14.74% | 39.21% | 200.33% | -71.76% | -21.59% | 286.00% | -1.88% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -39.2% | 19.56% | 21.07% | 51.50% | 55.74% | 39.73% | -3.66% | 79.75% | 148.88% | 37.18% | 32.18% |
| Annual Growth RONA b.I.a.T. | | | -7.18% | -59.08% | -7.60% | 40.27% | 1185.00% | -104.59% | -46.44% | 300.43% | 15.52% | base year |
| EBITDA per WLU | EBITDA / WLUs | 395.6% | 2.44 € | 2.11 € | 2.12 € | 1.90 € | 1.33 € | 0.45 € | 1.72 € | 2.60 € | 0.61 € | 0.49 € |
| Inflation-Adjusted EBITDA per WLU | | 251.4% | 2.21 € | 1.95 € | 2.00 € | 1.83 € | 1.33 € | 0.47 € | 1.89 € | 2.97 € | 0.73 € | 0.63 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 707.1% | 10.42% | 6.82% | 6.73% | 4.46% | 5.12% | 1.06% | 3.67% | 6.47% | -0.97% | -1.72% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 168.0% | 16.72% | 11.38% | 26.42% | 21.80% | 29.09% | 7.55% | 26.47% | 61.81% | -20.41% | -24.59% |
| Annual Growth ROE (Shareh. Funds) | | | 46.89% | -56.92% | 21.23% | -25.06% | 285.46% | -71.49% | -57.18% | 402.84% | 16.99% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -44.5% | 50.35% | 53.00% | 77.27% | 82.92% | 85.77% | 86.04% | 86.57% | 89.53% | 94.88% | 90.73% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -89.6% | 101.42% | 112.78% | 339.89% | 485.53% | 602.92% | 616.46% | 644.67% | 854.92% | 1851.39% | 979.33% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -80.3% | 1.815 | 2.191 | 2.350 | 2.487 | 2.489 | 5.192 | 6.943 | 7.980 | 7.235 | 9.231 |

## NAP – Naples, Italy

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 435.9% | 49.65% | 47.00% | 22.73% | 17.08% | 14.23% | 13.96% | 13.43% | 10.47% | 5.12% | 9.27% |
| Financial Leverage | Total Assets / Shareh. Funds | -81.3% | 201.42% | 212.78% | 439.89% | 585.53% | 702.92% | 716.46% | 744.67% | 954.92% | 1951.39% | 1079.33% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 4171.7% | 7,985 € | 5,663 € | 4,521 € | 3,144 € | 2,739 € | 1,407 € | 1,775 € | 2,692 € | 500 € | 187 € |
| Annual Growth Cash Flow | | | 41.02% | 25.26% | 43.78% | 14.80% | 94.70% | -20.73% | -34.08% | 438.00% | 167.67% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 2251.2% | 2.22 € | 1.52 € | 1.43 € | 1.14 € | 1.13 € | 0.62 € | 0.85 € | 1.32 € | 0.26 € | 0.09 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 1830.4% | 18.18% | 14.95% | 13.34% | 10.25% | 10.48% | 5.69% | 7.16% | 9.46% | 2.07% | 0.94% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 458.8% | 0.800 | 1.820 | 3.129 | 1.396 | 0.396 | 1.094 | 1.377 | 2.409 | 0.254 | 0.143 |
| Tax Rate | Taxes Paid / EBT | 53.1% | 103.20% | 50.54% | 53.05% | 54.58% | 49.59% | 650.88% | 61.85% | 49.11% | 47.39% | 67.40% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -88.8% | 1.605 | 1.670 | 3.927 | 4.888 | 5.685 | 7.102 | 7.202 | 9.559 | 21.034 | 14.332 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -55 € | -1,993 € | 2,551 € | 3,076 € | 892 € | -4,177 € | 121 € | 486 € | 1,575 € | -1,467 € | -1,118 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 315.5% | 2.81 € | 0.85 € | 0.47 € | 0.83 € | 2.90 € | 0.58 € | 0.63 € | 0.56 € | 1.06 € | 0.68 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 194.6% | 2.56 € | 0.79 € | 0.44 € | 0.80 € | 2.90 € | 0.61 € | 0.69 € | 0.65 € | 1.28 € | 0.87 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 245.5% | 22.72% | 8.22% | 4.26% | 7.34% | 26.46% | 5.20% | 5.20% | 3.93% | 8.15% | 6.58% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 18.2% | 2.926 | 1.010 | 0.645 | 1.268 | 4.935 | 1.124 | 1.491 | 1.311 | 2.679 | 2.475 |

## NCL – Newcastle, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 24.8% | 24.14% | 33.65% | 29.04% | 26.11% | 31.88% | 31.93% | 26.66% | 29.24% | 22.19% | 19.35% |
| Annual Growth Operating Margin | | | -28.26% | 15.87% | 11.23% | -18.10% | -0.16% | 19.77% | -8.84% | 31.77% | 14.69% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 14.1% | 41.62% | 48.90% | 47.54% | 44.47% | 47.28% | 46.39% | 41.04% | 43.71% | 38.91% | 36.47% |
| Annual Growth EBITDA Margin | | | -14.89% | 2.85% | 6.92% | -5.95% | 1.93% | 13.03% | -6.10% | 12.33% | 6.68% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 28.3% | 12.38% | 19.94% | 16.87% | 14.92% | 20.12% | 20.74% | 17.21% | 18.68% | 12.53% | 9.65% |
| Annual Growth RONA b.I.a.T. | | | -37.91% | 18.19% | 13.03% | -25.83% | -2.98% | 20.53% | -7.87% | 49.09% | 29.80% | base year |
| EBITDA per WLU | EBITDA / WLUs | 29.7% | 7.55 € | 9.02 € | 8.83 € | 7.07 € | 7.03 € | 7.30 € | 6.88 € | 7.36 € | 6.93 € | 5.82 € |
| Inflation-Adjusted EBITDA per WLU | | 0.4% | 6.81 € | 8.26 € | 8.34 € | 6.90 € | 7.03 € | 7.53 € | 7.29 € | 7.94 € | 7.71 € | 6.79 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 22.4% | 16.95% | 24.06% | 18.61% | 14.51% | 20.81% | 21.17% | 17.99% | 19.87% | 14.47% | 13.85% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 25.8% | 8.69% | 14.25% | 10.81% | 8.29% | 13.13% | 13.75% | 11.61% | 12.69% | 8.17% | 6.91% |
| Annual Growth ROE (Shareh. Funds) | | | -39.01% | 31.85% | 30.33% | -36.85% | -4.50% | 18.42% | -8.48% | 55.40% | 18.18% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -11.3% | 21.31% | 25.37% | 24.65% | 25.04% | 27.52% | 29.01% | 28.51% | 26.61% | 23.59% | 24.02% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -14.3% | 27.08% | 33.99% | 32.71% | 33.41% | 37.97% | 40.86% | 39.88% | 36.25% | 30.86% | 31.61% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -4.2% | 0.439 | 0.565 | 0.589 | 0.524 | 0.558 | 0.534 | 0.569 | 0.595 | 0.504 | 0.459 |

## NCL – Newcastle, UK

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 3.6% | 78.69% | 74.63% | 75.35% | 74.96% | 72.48% | 70.99% | 71.49% | 73.39% | 76.41% | 75.98% |
| Financial Leverage | Total Assets / Shareh. Funds | -3.4% | 127.08% | 133.99% | 132.71% | 133.41% | 137.97% | 140.86% | 139.88% | 136.25% | 130.86% | 131.61% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 143.3% | 18,797 € | 21,974 € | 18,602 € | 13,070 € | 14,111 € | 13,830 € | 11,771 € | 11,547 € | 9,158 € | 7,727 € |
| Annual Growth Cash Flow | | | -14.46% | 18.13% | 42.33% | -7.38% | 2.03% | 17.49% | 1.94% | 26.08% | 18.52% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 26.4% | 6.25 € | 7.25 € | 6.89 € | 5.22 € | 5.39 € | 5.60 € | 5.42 € | 5.78 € | 5.55 € | 4.95 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 11.1% | 34.43% | 39.30% | 37.11% | 32.87% | 36.21% | 35.63% | 32.38% | 34.33% | 31.18% | 30.98% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -30.6% | 0.662 | 0.902 | 2.742 | 1.517 | 1.913 | 0.802 | 0.859 | 1.566 | 1.079 | 0.955 |
| Tax Rate | Taxes Paid / EBT | -13.5% | 31.47% | 32.82% | 39.08% | 44.95% | 34.88% | 33.99% | 32.48% | 32.86% | 35.51% | 36.37% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 2.8% | 0.513 | 0.593 | 0.581 | 0.572 | 0.631 | 0.650 | 0.646 | 0.639 | 0.564 | 0.499 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 10,194 € | -9,577 € | -2,374 € | 11,817 € | 4,456 € | 6,735 € | -3,406 € | -1,927 € | 4,171 € | 667 € | -368 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 80.7% | 9.57 € | 8.15 € | 2.56 € | 3.50 € | 2.87 € | 7.07 € | 6.42 € | 3.75 € | 5.25 € | 5.29 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 39.8% | 8.63 € | 7.47 € | 2.42 € | 3.42 € | 2.87 € | 7.30 € | 6.81 € | 4.05 € | 5.85 € | 6.17 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 60.2% | 51.97% | 43.55% | 13.54% | 21.66% | 18.93% | 44.41% | 37.67% | 21.93% | 28.91% | 32.45% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 56.9% | 2.974 | 2.856 | 0.732 | 1.180 | 1.229 | 3.071 | 2.620 | 1.516 | 1.730 | 1.895 |

## RIA – AerRianta Group, Ireland

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | -35.2% | 13.26% | 18.01% | 16.91% | 16.68% | 16.14% | 15.18% | 14.25% | 14.83% | 17.57% | 20.47% |
| Annual Growth Operating Margin | | | -26.37% | 6.53% | 1.38% | 3.33% | 6.37% | 6.46% | -3.88% | -15.59% | -14.20% | base year |
| EBITDA Margin | EBITDA / Total Revenue | -15.5% | 19.46% | 22.92% | 21.66% | 21.31% | 21.33% | 20.24% | 18.14% | 18.50% | 20.76% | 23.01% |
| Annual Growth EBITDA Margin | | | -15.11% | 5.80% | 1.66% | -0.08% | 5.39% | 11.59% | -1.98% | -10.90% | -9.78% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -64.6% | 16.14% | 23.20% | 24.15% | 27.20% | 29.71% | 31.76% | 32.50% | 33.27% | 39.23% | 45.57% |
| Annual Growth RONA b.I.a.T. | | | -30.43% | -3.93% | -11.24% | -8.44% | -6.44% | -2.29% | -2.31% | -15.19% | -13.92% | base year |
| EBITDA per WLU | EBITDA / WLUs | -21.1% | 4.17 € | 4.95 € | 5.16 € | 4.97 € | 5.04 € | 5.06 € | 4.64 € | 4.67 € | 5.43 € | 5.28 € |
| Inflation-Adjusted EBITDA per WLU | | -35.1% | 3.88 € | 4.68 € | 5.01 € | 4.89 € | 5.04 € | 5.18 € | 4.87 € | 4.97 € | 5.96 € | 5.98 € |
| Return on Total Revenue (Return on Sales - ROS) | Net Income / Total Revenue | -47.8% | 10.60% | 18.02% | 17.04% | 17.04% | 16.03% | 14.13% | 11.74% | 11.90% | 15.00% | 20.31% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | -71.5% | 12.89% | 23.20% | 24.33% | 27.79% | 29.50% | 29.57% | 26.76% | 26.70% | 33.50% | 45.21% |
| Annual Growth ROE (Shareh. Funds) | | | -44.44% | -4.64% | -12.45% | -5.78% | -0.26% | 10.52% | 0.22% | -20.30% | -25.89% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -1.9% | 54.28% | 53.53% | 53.79% | 48.60% | 52.11% | 56.37% | 58.46% | 57.08% | 58.38% | 55.31% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -4.1% | 118.70% | 115.20% | 116.40% | 94.53% | 108.80% | 129.20% | 140.75% | 132.98% | 140.25% | 123.75% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -57.6% | 0.609 | 0.706 | 0.794 | 1.177 | 1.166 | 1.166 | 1.169 | 1.183 | 1.172 | 1.435 |

## RIA – AerRianta Group, Ireland

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 2.3% | 45.72% | 46.47% | 46.21% | 51.40% | 47.89% | 43.63% | 41.54% | 42.92% | 41.62% | 44.69% |
| Financial Leverage | Total Assets / Shareh. Funds | -2.3% | 218.70% | 215.20% | 216.40% | 194.53% | 208.80% | 229.20% | 240.75% | 232.98% | 240.25% | 223.75% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 52.1% | 62,444 € | 77,629 € | 72,845 € | 62,930 € | 55,560 € | 46,260 € | 33,599 € | 32,091 € | 34,925 € | 41,043 € |
| Annual Growth Cash Flow | | | -19.56% | 6.57% | 15.76% | 13.26% | 20.10% | 37.68% | 4.70% | -8.12% | -14.91% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -31.4% | 3.60 € | 4.95 € | 5.19 € | 5.06 € | 5.01 € | 4.80 € | 3.99 € | 3.93 € | 4.76 € | 5.24 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -26.5% | 16.79% | 22.93% | 21.79% | 21.67% | 21.21% | 19.19% | 15.62% | 15.57% | 18.20% | 22.85% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | -60.2% | 0.419 | 0.805 | 1.006 | 2.277 | 1.776 | 1.507 | 1.142 | 1.426 | 0.921 | 1.054 |
| Tax Rate | Taxes Paid / EBT | 2498.6% | 26.54% | 8.76% | 8.35% | 7.97% | 9.47% | 12.49% | 9.23% | 5.27% | 0.42% | 1.02% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -45.3% | 1.217 | 1.288 | 1.428 | 1.631 | 1.841 | 2.093 | 2.280 | 2.243 | 2.233 | 2.226 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -16,926 € | -86,602 € | -18,752 € | 421 € | 35,287 € | 24,274 € | 15,570 € | 4,183 € | 9,591 € | -2,983 € | 2,085 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 72.2% | 9.44 € | 6.76 € | 5.68 € | 2.42 € | 3.09 € | 3.49 € | 3.86 € | 3.04 € | 5.65 € | 5.48 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 41.6% | 8.79 € | 6.40 € | 5.50 € | 2.38 € | 3.09 € | 3.58 € | 4.05 € | 3.23 € | 6.20 € | 6.21 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 84.8% | 40.07% | 28.46% | 21.67% | 9.52% | 11.94% | 12.73% | 13.67% | 10.92% | 19.75% | 21.69% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -24.2% | 6.472 | 5.801 | 4.557 | 2.055 | 2.303 | 2.516 | 3.524 | 2.974 | 6.182 | 8.541 |

## STN – Stansted, UK

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999/00** | **1998/99** | **1997/98** | **1996/97** | **1995/96** | **1994/95** | **1993/94** | **1992/93** | **1991/92** | **1990/91** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 116.8% | 22.07% | 21.21% | 6.59% | 0.15% | -18.39% | -32.29% | -53.90% | -85.36% | -137.10% | -131.28% |
| Annual Growth Operating Margin | | | 4.03% | 222.09% | 4325.75% | 100.81% | 43.07% | 40.09% | 36.85% | 37.74% | -4.43% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 136.4% | 38.34% | 38.54% | 29.59% | 19.94% | 10.71% | -1.44% | -11.86% | -26.40% | -79.40% | -105.44% |
| Annual Growth EBITDA Margin | | | -0.53% | 30.27% | 48.37% | 86.22% | 842.33% | 87.84% | 55.07% | 66.75% | 24.69% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 158.4% | 3.54% | 3.22% | 0.85% | 0.02% | -6.14% | -8.42% | -9.04% | -10.00% | -11.00% | -6.07% |
| Annual Growth RONA b.I.a.T. | | | 10.11% | 279.08% | 3877.27% | 100.35% | 27.07% | 6.87% | 9.60% | 9.10% | -81.16% | base year |
| EBITDA per WLU | EBITDA / WLUs | 136.8% | 4.81 € | 4.81 € | 3.84 € | 2.73 € | 1.34 € | -0.19 € | -1.59 € | -3.23 € | -9.85 € | -13.05 € |
| Inflation-Adjusted EBITDA per WLU | | 128.5% | 4.33 € | 4.41 € | 3.63 € | 2.67 € | 1.34 € | -0.19 € | -1.69 € | -3.48 € | -10.96 € | -15.21 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | -63.5% | 15.78% | 10.58% | -3.54% | -27.83% | -49.49% | -52.24% | -73.12% | -124.13% | -127.97% | 43.26% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 26.6% | 2.53% | 1.61% | -0.46% | -3.99% | -16.52% | -13.62% | -12.26% | -14.54% | -10.27% | 2.00% |
| Annual Growth ROE (Shareh. Funds) | | | 57.77% | 452.12% | 88.58% | 75.84% | -21.35% | -11.07% | 15.67% | -41.61% | -613.11% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -51.0% | 24.82% | 24.44% | 23.45% | 24.92% | 73.10% | 70.89% | 63.49% | 61.19% | 56.89% | 50.61% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -67.8% | 33.01% | 32.34% | 30.63% | 33.19% | 271.77% | 243.58% | 173.90% | 157.64% | 131.97% | 102.47% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 421.0% | 0.127 | 0.121 | 0.100 | 0.111 | 0.094 | 0.079 | 0.064 | 0.048 | 0.037 | 0.024 |

## STN – Stansted, UK

## Financial Ratio Analysis (FRA) cont'd

| Group 2: Debt and Asset Management cont'd | | Growth 90-99 | 1999/00 | 1998/99 | 1997/98 | 1996/97 | 1995/96 | 1994/95 | 1993/94 | 1992/93 | 1991/92 | 1990/91 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 52.2% | 75.18% | 75.56% | 76.55% | 75.08% | 26.90% | 29.11% | 36.51% | 38.81% | 43.11% | 49.39% |
| Financial Leverage | Total Assets / Shareh. Funds | -34.3% | 133.01% | 132.34% | 130.63% | 133.19% | 371.77% | 343.58% | 273.90% | 257.64% | 231.97% | 202.47% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 261.4% | 47,658 € | 33,411 € | 17,854 € | -6,908 € | -13,190 € | -11,992 € | -14,873 € | -23,471 € | -20,972 € | 13,189 € |
| Annual Growth Cash Flow | | | 42.64% | 87.13% | 358.47% | 47.63% | -9.99% | 19.37% | 36.63% | -11.92% | -259.02% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | -53.0% | 4.02 € | 3.48 € | 2.53 € | -1.10 € | -2.55 € | -2.77 € | -4.18 € | -7.96 € | -8.72 € | 8.55 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | -53.6% | 32.05% | 27.91% | 19.46% | -8.04% | -20.40% | -21.39% | -31.08% | -65.18% | -70.27% | 69.11% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 962.8% | 0.609 | 0.482 | 0.646 | -0.213 | -0.954 | -0.347 | -1.239 | -1.242 | -0.486 | 0.057 |
| Tax Rate | Taxes Paid / EBT | 105.5% | 7.30% | 3.01% | -65.29% | -40.45% | -34.75% | -40.74% | -40.14% | -41.58% | -54.08% | -132.95% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | 247.2% | 0.161 | 0.152 | 0.129 | 0.143 | 0.334 | 0.261 | 0.168 | 0.117 | 0.080 | 0.046 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -539,662 € | -30,644 € | -35,888 € | -9,785 € | -39,272 € | -27,014 € | -46,544 € | -26,877 € | -42,375 € | -64,151 € | -217,110 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -95.9% | 7.81 € | 9.20 € | 4.95 € | 6.43 € | 3.35 € | 10.28 € | 4.29 € | 8.02 € | 21.55 € | 190.96 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -96.8% | 7.05 € | 8.43 € | 4.67 € | 6.28 € | 3.35 € | 10.62 € | 4.55 € | 8.65 € | 23.98 € | 222.58 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -95.6% | 52.65% | 57.90% | 30.13% | 37.65% | 21.38% | 61.64% | 25.09% | 52.50% | 144.69% | 1206.74% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -93.1% | 3.236 | 3.341 | 1.310 | 1.902 | 0.735 | 1.998 | 0.597 | 0.890 | 2.508 | 46.694 |

## VIE – Vienna, Austria

## Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 193.8% | 26.47% | 20.47% | 18.65% | 17.65% | 21.08% | 18.76% | 12.61% | 18.59% | 15.83% | 9.01% |
| Annual Growth Operating Margin | | | 29.33% | 9.72% | 5.66% | -16.26% | 12.41% | 48.72% | -32.17% | 17.42% | 75.77% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 92.3% | 41.55% | 34.99% | 34.33% | 33.27% | 35.44% | 33.96% | 27.73% | 31.62% | 28.15% | 21.61% |
| Annual Growth EBITDA Margin | | | 18.74% | 1.94% | 3.18% | -6.12% | 4.36% | 22.44% | -12.31% | 12.36% | 30.25% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | 37.6% | 14.64% | 11.95% | 10.75% | 10.51% | 15.03% | 14.68% | 9.86% | 14.22% | 19.50% | 10.64% |
| Annual Growth RONA b.I.a.T. | | | 22.54% | 11.17% | 2.31% | -30.09% | 2.33% | 48.95% | -30.65% | -27.10% | 83.28% | base year |
| EBITDA per WLU | EBITDA / WLUs | 89.9% | 10.71 € | 9.53 € | 9.52 € | 10.23 € | 11.11 € | 10.42 € | 8.46 € | 9.11 € | 7.99 € | 5.64 € |
| Inflation-Adjusted EBITDA per WLU | | 55.1% | 10.26 € | 9.18 € | 9.26 € | 10.07 € | 11.11 € | 10.66 € | 8.90 € | 9.94 € | 9.07 € | 6.61 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 184.0% | 17.63% | 16.11% | 14.95% | 14.67% | 17.38% | 16.07% | 16.58% | 14.87% | 13.35% | 6.21% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 33.0% | 9.75% | 9.41% | 8.62% | 8.73% | 12.39% | 12.58% | 12.96% | 11.37% | 16.43% | 7.33% |
| Annual Growth ROE (Shareh. Funds) | | | 3.67% | 9.15% | -1.27% | -29.55% | -1.55% | -2.91% | 14.03% | -30.84% | 124.23% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -55.3% | 25.46% | 24.92% | 24.97% | 29.85% | 42.75% | 46.42% | 48.19% | 46.24% | 58.02% | 56.98% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -74.2% | 34.16% | 33.18% | 33.28% | 42.54% | 74.67% | 86.62% | 93.03% | 86.03% | 138.23% | 132.44% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | -7.6% | 0.625 | 0.642 | 0.578 | 0.580 | 0.565 | 0.557 | 0.541 | 0.591 | 0.608 | . 0.676 |

## VIE – Vienna, Austria

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 73.3% | 74.54% | 75.08% | 75.03% | 70.15% | 57.25% | 53.58% | 51.81% | 53.76% | 41.98% | 43.02% |
| Financial Leverage | Total Assets / Shareh. Funds | -42.3% | 134.16% | 133.18% | 133.28% | 142.54% | 174.67% | 186.62% | 193.03% | 186.03% | 238.23% | 232.44% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 246.0% | 103,854 € | 97,329 € | 91,134 € | 92,802 € | 93,068 € | 80,741 € | 75,253 € | 59,294 € | 45,813 € | 30,015 € |
| Annual Growth Cash Flow | | | 6.70% | 6.80% | -1.80% | -0.29% | 15.27% | 7.29% | 26.91% | 29.43% | 52.63% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 71.7% | 8.43 € | 8.35 € | 8.49 € | 9.31 € | 9.95 € | 9.60 € | 9.67 € | 8.04 € | 7.28 € | 4.91 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 73.9% | 32.71% | 30.64% | 30.63% | 30.28% | 31.73% | 31.27% | 31.70% | 27.90% | 25.66% | 18.81% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 215.0% | 1.623 | 3.552 | 1.374 | 1.010 | 0.892 | 1.213 | 0.720 | 0.582 | 0.472 | 0.515 |
| Tax Rate | Taxes Paid / EBT | -22.4% | 38.49% | 32.42% | 32.59% | 32.00% | 29.59% | 24.24% | 2.09% | 16.53% | 25.68% | 49.59% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -53.2% | 0.553 | 0.584 | 0.576 | 0.595 | 0.713 | 0.783 | 0.782 | 0.765 | 1.231 | 1.181 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 -12,802 € | 39,866 € | 69,925 € | 24,828 € | 927 € | -11,261 € | 14,173 € | -29,274 € | -42,505 € | -51,243 € | -28,238 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | -45.7% | 5.78 € | 2.61 € | 6.91 € | 10.26 € | 12.46 € | 8.85 € | 14.92 € | 15.37 € | 17.35 € | 10.65 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | -55.6% | 5.54 € | 2.51 € | 6.72 € | 10.11 € | 12.46 € | 9.05 € | 15.70 € | 16.76 € | 19.70 € | 12.49 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | -44.8% | 20.15% | 8.63% | 22.28% | 29.98% | 35.57% | 25.78% | 44.03% | 47.89% | 54.35% | 36.50% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | -53.9% | 1.336 | 0.594 | 1.422 | 1.920 | 2.479 | 1.696 | 2.912 | 3.675 | 4.415 | 2.897 |

## ZRH – Zurich, Switzerland

### Financial Ratio Analysis (FRA)

| **Group 1: Profitability** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Margin, Profit Margin | EBIT / Total Revenue | 72.6% | 18.53% | 16.42% | 15.59% | 12.13% | 10.60% | 10.38% | 8.21% | 8.76% | 7.82% | 10.74% |
| Annual Growth Operating Margin | | | 12.88% | 5.33% | 28.45% | 14.49% | 2.05% | 26.44% | -6.26% | 12.05% | -27.16% | base year |
| EBITDA Margin | EBITDA / Total Revenue | 16.9% | 28.65% | 28.52% | 31.70% | 25.00% | 22.91% | 20.49% | 16.81% | 18.91% | 16.75% | 24.50% |
| Annual Growth EBITDA Margin | | | 0.48% | -10.05% | 26.80% | 9.11% | 11.80% | 21.91% | -11.12% | 12.94% | -31.65% | base year |
| Return on Net Assets (RONA b.I.a.T.) | EBIT / Net Assets | -35.2% | 27.50% | 29.48% | 37.17% | 36.41% | 37.54% | 40.35% | 35.21% | 37.43% | 32.04% | 42.42% |
| Annual Growth RONA b.I.a.T. | | | -6.72% | -20.68% | 2.11% | -3.02% | -6.96% | 14.59% | -5.94% | 16.83% | -24.46% | base year |
| EBITDA per WLU | EBITDA / WLUs | 29.3% | 2.81 € | 2.75 € | 3.31 € | 2.73 € | 2.48 € | 2.12 € | 1.65 € | 1.74 € | 1.53 € | 2.17 € |
| Inflation-Adjusted EBITDA per WLU | | 8.3% | 2.75 € | 2.71 € | 3.27 € | 2.71 € | 2.48 € | 2.15 € | 1.69 € | 1.85 € | 1.69 € | 2.54 € |
| Return on Total Revenue (Return on Sales – ROS) | Net Income / Total Revenue | 402.4% | 16.14% | 13.20% | 12.23% | 6.16% | 4.36% | 3.91% | 0.76% | 1.19% | -0.65% | 3.21% |
| Return on Shareholders' Funds (Return on Equity - ROE) | Net Income / Shareh. Funds | 88.8% | 23.95% | 23.71% | 29.17% | 18.48% | 15.43% | 15.19% | 3.24% | 5.08% | -2.64% | 12.69% |
| Annual Growth ROE (Shareh. Funds) | | | 1.00% | -18.71% | 57.83% | 19.75% | 1.59% | 369.01% | -36.20% | 292.08% | -120.83% | base year |
| **Group 2: Debt and Asset Management** | | | | | | | | | | | | |
| Debt Ratio | Total Debt / Total Assets | -59.1% | 30.98% | 41.51% | 54.65% | 66.83% | 73.67% | 75.75% | 78.78% | 78.14% | 78.71% | 75.73% |
| Gearing (Debt / Equity Ratio) | Total Debt / Shareh. Funds | -85.6% | 44.88% | 70.98% | 120.53% | 201.49% | 279.76% | 312.40% | 371.22% | 357.53% | 369.80% | 312.11% |
| Fixed Asset Turnover | Total Revenue / Fixed Assets | 17.2% | 1.314 | 1.426 | 1.460 | 1.218 | 1.173 | 1.120 | 1.078 | 1.098 | 1.024 | 1.122 |

## ZRH – Zurich, Switzerland

## Financial Ratio Analysis (FRA) cont'd

| **Group 2: Debt and Asset Management cont'd** | | **Growth 90-99** | **1999** | **1998** | **1997** | **1996** | **1995** | **1994** | **1993** | **1992** | **1991** | **1990** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Assets (Net Worth, incl. Preferred Shares) in Percent of Total Assets | Net Assets / Total Assets | 184.5% | 69.02% | 58.49% | 45.35% | 33.17% | 26.33% | 24.25% | 21.22% | 21.86% | 21.29% | 24.27% |
| Financial Leverage | Total Assets / Shareh. Funds | -64.8% | 144.88% | 170.98% | 220.53% | 301.49% | 379.76% | 412.40% | 471.22% | 457.53% | 469.80% | 412.11% |
| **Group 3: P&L Accounts & Indicators** | | | | | | | | | | | | |
| Cash Flow (in '000) | Net Income + Depreciation | 170.4% | 63,024 € | 54,717 € | 63,547 € | 40,027 € | 33,224 € | 25,298 € | 14,901 € | 16,389 € | 11,025 € | 23,305 € |
| Annual Growth Cash Flow | | | 15.18% | -13.90% | 58.76% | 20.48% | 31.33% | 69.78% | -9.08% | 48.65% | -52.69% | base year |
| Cash Flow per WLU | Cash Flow / WLUs | 71.0% | 2.57 € | 2.44 € | 2.96 € | 2.08 € | 1.80 € | 1.45 € | 0.92 € | 1.05 € | 0.76 € | 1.51 € |
| Cash Flow in Percent of Total Revenue | Cash Flow / Total Revenue | 54.7% | 26.26% | 25.30% | 28.35% | 19.03% | 16.67% | 14.02% | 9.35% | 11.34% | 8.28% | 16.98% |
| Investment Coverage Ratio | Cash Flow / Cap. Expendit. | 14.7% | 1.231 | 2.032 | 2.440 | 1.473 | 1.129 | 1.115 | 0.692 | 0.918 | 0.452 | 1.073 |
| Tax Rate | Taxes Paid / EBT | 0.0% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Total Revenue per Currency Unit of Shareholders' Funds | Total Revenue / Shareh. Funds | -62.4% | 1.484 | 1.796 | 2.385 | 3.000 | 3.542 | 3.885 | 4.287 | 4.272 | 4.097 | 3.951 |
| Owner Earnings (in '000) | Cash Flow - Investment | Σ 90-99 76,463 € | 11,825 € | 27,787 € | 37,508 € | 12,854 € | 3,783 € | 2,601 € | -6,645 € | -1,465 € | -13,375 € | 1,589 € |
| Capital Expenditure per Terminal Passenger | Investment / Terminal PAX | 45.5% | 2.47 € | 1.42 € | 1.45 € | 1.71 € | 1.97 € | 1.61 € | 1.63 € | 1.40 € | 2.05 € | 1.70 € |
| Infl.-Adj. Capital Exp. per Term. PAX | | 21.9% | 2.42 € | 1.40 € | 1.43 € | 1.70 € | 1.97 € | 1.64 € | 1.68 € | 1.48 € | 2.26 € | 1.99 € |
| Capital Expenditure in Percent of Total Revenue | Investment / Total Revenue | 34.8% | 21.33% | 12.45% | 11.61% | 12.92% | 14.77% | 12.58% | 13.52% | 12.35% | 18.33% | 15.82% |
| Capital Expenditure to Depreciation Ratio | Investment / Depr. Cost | 83.4% | 2.107 | 1.029 | 0.721 | 1.004 | 1.200 | 1.244 | 1.573 | 1.217 | 2.053 | 1.149 |

## Appendix B.5: Results of Data Envelopment Analysis

Table B.5.1: DEA Results (Scores and Returns to Scale), BCC-i-Sub Model 'Physical & Financial Efficiency' (ranking according to long-term average score and alphabetical order)

| Airport /Group | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| AMS | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d |
| **BAA** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** |
| BRU | * | * | 1 c | 1 c | 1 c | 1 c | 1 c | 1 c | 1 c | 1 c |
| CWL | 1 i | 1 c | 1 i | 1 i | 1 c | 1 i | 1 i | 1 i | 1 i | 1 i |
| LHR | 1 d | 1 d | 1 d | 1 d | 1 d | 1 c | 1 c | 1 c | 1 d | 1 d |
| LPL | 1 i | 1 i | 1 i | 1 i | 1 c | 1 c | 1 i | 1 i | 1 i | .9135 i |
| EMA | 1 c | 1 c | 1 c | 1 c | 1 c | 1 i | 1 i | .8952 i | 1 c | .6901 d |
| CPH | .9955 d | 1 c | 1 d | .9920 d | 1 c | 1 c | .9994 c | .8675 i | .8506 d | .8624 d |
| FRA | 1 d | .8856 d | 1 d | .8851 d | .7854 d | .8449 d | 1 d | 1 d | 1 d | 1 d |
| LBA | .8689 i | .8178 c | .9191 i | .8817 i | .8624 c | 1 i | 1 i | .9767 i | 1 i | 1 i |
| LGW | 1 d | .9656 d | .9291 d | .9265 d | .8677 d | .9010 i | .8872 i | .8783 i | .8768 d | .9262 d |
| EDI | .9675 c | .9716 c | .7937 d | .7928 i | .9979 c | 1 i | 1 i | .9776 i | .8367 d | .7648 d |
| BFS | 1 c | 1 c | 1 c | .9358 i | .8645 c | .8767 i | .9571 i | .8709 i | .7866 d | .7536 d |
| ABZ | .8669 i | .9049 c | .8131 c | .7798 i | .9102 c | .9998 i | 1 i | 1 i | .8784 i | .7893 d |
| NAP | .9029 c | 1 c | .9110 c | .7769 i | .9185 c | .9243 i | .8705 i | .8158 i | .7320 i | .7285 c |
| GLA | .8745 d | .8482 d | .7474 d | .5920 d | .8021 d | .9595 i | .9986 i | .8631 i | .9194 d | .9193 d |
| BHX | .9020 d | .8733 d | .8644 d | 1 c | .9123 d | .8937 i | .8054 i | .7820 i | .7248 d | .7486 d |
| ZRH | 1 c | 1 c | .9016 d | .8178 d | .8046 d | .8283 i | .8054 i | .7718 i | .7640 d | .7923 d |
| **RIA** | **.8360 d** | **.8716 d** | **.9157 d** | **.8094 d** | **.8182 d** | **.8560 i** | **.8249 i** | **.7868 i** | **.8164 d** | **.8795 d** |
| MRS | .9371 c | .8848 c | .8370 c | .7584 i | .8754 c | .8586 i | .8351 i | .7766 i | .8158 i | .8162 c |
| **ADP** | **.9582 d** | **.7819 d** | **.8716 d** | **.7791 d** | **.7545 d** | **.7966 d** | **.8163 d** | **.8076 d** | **.9149 d** | **.9071 d** |
| VIE | .9021 d | .8506 d | .8896 d | .7908 d | .8323 d | .8752 i | .8719 i | .8138 i | .8002 d | .7451 d |
| NCL | .7256 d | .8440 d | .7556 d | .6402 i | .8597 d | .9905 i | .9343 i | .9350 i | .7744 d | .6993 d |
| MAN | .8064 d | .8021 d | .8378 d | .7372 d | .7560 d | .7901 i | .7688 i | .8742 i | .7946 d | .8434 d |
| DUS | * | * | * | * | .7364 d | .7826 i | .8069 i | .7630 i | .7739 d | .8104 d |
| CGN | .7783 d | .7056 d | .8824 d | .6543 d | .7597 d | .7942 i | .7909 i | .7446 i | .7501 d | .7315 d |
| HAM | .8555 d | .8028 d | .8296 d | .7263 d | .7284 d | .7768 i | .7556 i | .6730 i | .7002 d | .7131 d |
| ADR | .8090 d | .7994 d | .8345 d | .7634 d | .7282 d | .7567 i | .7386 i | .6914 i | .7038 d | .7195 d |
| BRS | .7642 i | .8176 c | .4835 i | .6417 i | .7429 d | .9173 i | .8694 i | .8439 i | .6856 i | .6233 d |
| GVA | .6242 d | .7871 d | .7397 d | .5877 d | .7339 d | .7703 i | .7690 i | .7336 i | .7300 d | .7206 d |
| HAJ | .6575 d | .6572 d | .7569 d | .6084 d | .7293 d | .8184 i | .7887 i | .7189 i | .7269 d | .7097 d |
| BSL | .6378 d | .6822 c | .6370 d | .6086 i | .6403 d | .7202 i | .7491 i | .8275 i | .6940 d | .6351 d |
| LTN | * | * | .7164 d | .5950 i | .6443 d | .7577 i | .7213 i | .7475 i | .6531 d | .6031 d |
| **BER** | **.7488 d** | **.5446 d** | **.7042 d** | **.5754 d** | **.6069 d** | **.6026 i** | * | * | * | * |
| STN | .8804 d | .7992 d | .6735 d | .4965 c | .4779 d | .5086 i | .4612 i | .3449 i | .3040 d | 1 c |
| **Total Sample** | | | | | | | | | | |
| Average Efficiency | .88062 | .86766 | .85589 | .79251 | .82793 | .87060 | .87350 | .84186 | .81841 | .81865 |
| Minimum Efficiency | .62415 | .54458 | .48346 | .49650 | .47785 | .50862 | .46115 | .34491 | .30401 | .60309 |
| Standard Deviation | .11552 | .11784 | .12629 | .15696 | .13170 | .12115 | .12313 | .13503 | .14570 | .12503 |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98

The BAA Group is excluded from calculation of average efficiency to avoid double counting.

| | |
|---|---|
| Airports in the British Isles = yellow | Airport Systems = **bold** |
| Score of Decision Making Units (DMU) | min. score = 0.xxxxx; max. score = 1.0 |
| Returns to Scale (RTS) | i = increasing; c = constant; d = decreasing |

Table B.5.2: DEA Results (Scores and Returns to Scale), BCC-i-Sub Model 'Physical Efficiency' (ranking according to long-term average score and alphabetical order)

| Airport /Group | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| AMS | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d |
| **BAA** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** |
| BRU | * | * | 1 c | 1 c | 1 c | 1 c | 1 c | 1 c | 1 c | 1 c |
| LHR | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d | 1 d |
| LPL | 1 i | 1 i | 1 i | 1 i | 1 c | 1 c | 1 i | 1 i | 1 i | .9135 i |
| CWL | 1 i | 1 i | 1 i | 1 i | 1 i | .9158 i | .8848 i | .9397 i | 1 i | 1 i |
| FRA | 1 d | .8856 d | 1 d | .8851 d | .7854 d | .8449 d | 1 d | 1 d | 1 d | 1 d |
| CPH | .9016 i | .9737 i | .8887 d | .9665 d | 1 c | 1 d | .9994 d | .7769 d | .8438 d | .8324 d |
| LBA | .8519 i | .8178 i | .9191 i | .8817 i | .8624 i | 1 i | .9532 i | .8929 i | .9941 i | 1 i |
| EMA | 1 c | 1 c | 1 c | 1 c | .9858 c | .7985 i | .7396 i | .6332 i | .8854 i | .5774 i |
| LGW | .9461 d | .8525 d | .7844 d | .8991 d | .8657 d | .8431 d | .8292 d | .8457 d | .8276 d | .8561 d |
| ABZ | .8610 i | .8741 i | .8131 i | .7798 i | .9102 i | .9319 i | .8810 i | .8886 i | .8151 i | .7151 i |
| BFS | 1 i | 1 i | 1 i | .9358 i | .8645 i | .7916 i | .7923 i | .7083 i | .6889 i | .6490 i |
| EDI | .9675 i | .9415 i | .7717 i | .7928 i | .9979 i | .9507 i | .8217 i | .7983 i | .6793 i | .6292 i |
| MRS | .9371 i | .8848 i | .8370 i | .7584 i | .8754 i | .8585 i | .8081 i | .7518 i | .8119 i | .8162 i |
| NAP | .9029 i | 1 c | .9110 i | .7769 i | .9185 i | .9218 i | .8077 i | .6528 i | .6876 i | .7285 i |
| **ADP** | **.9582 d** | **.7816 d** | **.8716 d** | **.7209 d** | **.6242 d** | **.7706 d** | **.7805 d** | **.7677 d** | **.9149 d** | **.9071 d** |
| ZRH | 1 c | 1 c | .8278 d | .7764 d | .7557 d | .7381 d | .7432 d | .7231 d | .7515 d | .7712 d |
| NCL | .6638 i | .6971 i | .6213 i | .6210 i | .7942 i | .7971 i | .6695 i | .6409 i | .6136 i | .5845 i |
| GLA | .8031 i | .7912 c | .5968 i | .5658 c | .7394 i | .6956 i | .6192 i | .5610 i | .5705 i | .5656 i |
| BHX | .6607 i | .6684 c | .5481 i | 1 c | .8610 i | .7161 i | .5540 i | .4977 i | .4373 i | .4368 i |
| BSL | .6274 i | .6822 i | .5904 i | .5417 i | .5528 i | .5793 i | .5787 i | .6369 i | .6205 i | .6117 i |
| GVA | .5750 i | .7142 c | .5756 i | .4897 i | .6261 i | .5962 i | .5628 i | .5318 i | .5052 i | .4949 i |
| BRS | .5843 i | .6319 i | .4001 i | .4997 i | .5542 i | .6330 i | .5327 i | .4970 i | .5389 i | .5315 i |
| **BER** | **.6987 i** | **.5126 c** | **.5112 i** | **.4854 c** | **.5090 i** | **.4511 i** | * | * | * | * |
| CGN | .7783 d | .6662 d | .6759 c | .4562 c | .5458 c | .4936 c | .4470 i | .3823 i | .4138 i | .4001 i |
| MAN | .4721 i | .5173 c | .4179 d | .5705 d | .6208 d | .5411 d | .5185 d | .5483 d | .4576 d | .4712 d |
| STN | .7893 i | .7600 d | .5078 i | .3961 i | .4140 i | .3729 i | .2963 i | .2442 i | .2584 i | 1 i |
| LTN | * | * | .5549 i | .5384 i | .5035 i | .5415 i | .4916 i | .4839 i | .4398 i | .3977 i |
| DUS | * | * | * | * | .5222 d | .4830 d | .5210 d | .4661 d | .4298 d | .4090 d |
| HAM | .5626 i | .5373 c | .4594 i | .4431 c | .4520 i | .4198 i | .3750 i | .3408 i | .3599 i | .3735 i |
| ADR | .4518 d | .5522 d | .5064 d | .4677 d | .4549 d | .4206 d | .4248 d | .2985 d | .3045 d | .3911 d |
| HAJ | .3792 i | .3790 c | .3656 i | .3303 i | .4313 i | .4244 i | .3898 i | .3670 i | .3970 i | .2742 i |
| **RIA** | **.4625 i** | **.5074 c** | **.3756 i** | **.4109 c** | **.4258 i** | **.3651 i** | **.3054 i** | **.2817 i** | **.2684 i** | **.2968 i** |
| VIE | .4137 i | .3885 c | .3141 i | .2862 c | .3203 i | .3016 i | .2713 i | .2557 i | .2428 i | .2252 i |
| **Total Sample** | | | | | | | | | | |
| Average Efficiency | .78221 | .77474 | .71653 | .70533 | .72861 | .71169 | .68480 | .64887 | .65933 | .66240 |
| Minimum Efficiency | .37917 | .37903 | .31410 | .28620 | .32029 | .30158 | .27126 | .24423 | .24285 | .22519 |
| Standard Deviation | .20750 | .19725 | .23004 | .23410 | .21976 | .22498 | .23487 | .24307 | .25612 | .25061 |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
The BAA Group is excluded from calculation of average efficiency to avoid double counting.

| | |
|---|---|
| Airports in the British Isles = yellow | Airport Systems = **bold** |
| Score of Decision Making Units (DMU) | min. score = 0.xxxxx; max. score = 1.0 |
| Returns to Scale (RTS) | i = increasing; c = constant; d = decreasing |

Table B.5.3: DEA Results (Scores and Returns to Scale), BCC-i-Sub Model 'Financial Efficiency' (ranking according to long-term average score and alphabetical order)

| Airport /Group | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| **BAA** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** | **1 d** |
| CWL | 1 i | 1 c | 1 i | 1 i | 1 c | 1 i | 1 i | 1 i | 1 i | 1 i |
| LHR | 1 d | 1 d | 1 d | 1 d | 1 d | 1 c | 1 c | 1 c | 1 d | 1 d |
| LPL | .9596 i | 1 i | 1 i | 1 i | 1 i | 1 i | 1 i | 1 i | .8385 i | .8529 i |
| LBA | .8236 i | .7458 i | .8426 i | .7987 i | .8436 i | 1 i | 1 i | .9767 i | 1 i | 1 i |
| LGW | 1 d | .9507 d | .9242 d | .8706 d | .8147 d | .8774 i | .8625 i | .8478 i | .8543 d | .9142 d |
| EMA | .8830 i | .8629 d | .8200 i | .7753 i | .8449 d | .9711 i | .9405 i | .8848 i | 1 c | .6901 d |
| BFS | 1 c | 1 d | 1 c | .8500 i | .7393 d | .8512 i | .9159 i | .8496 i | .7339 d | .7136 d |
| AMS | .9678 d | .9534 d | .9876 d | .8450 d | .8251 d | .8433 i | .8172 i | .7819 i | .7635 d | .7743 d |
| CPH | .9285 d | .9234 d | .9421 d | .7953 d | .8580 d | .8935 i | .8562 i | .8005 i | .7548 d | .7259 d |
| ABZ | .8142 i | .8247 d | .7571 i | .7220 i | .8057 d | .9852 i | .9976 i | .9945 i | .8010 d | .7494 d |
| BHX | .9020 d | .8733 d | .8644 d | 1 c | .8389 d | .8856 i | .8049 i | .7820 i | .7248 d | .7486 d |
| **RIA** | **.8360 d** | **.8716 d** | **.9157 d** | **.8094 d** | **.8182 d** | **.8560 i** | **.8249 i** | **.7868 i** | **.8164 d** | **.8795 d** |
| GLA | .8471 d | .8067 d | .7329 d | .5920 d | .7496 d | .9584 i | .9986 i | .8631 i | .9075 d | .9193 d |
| EDI | .8312 d | .8447 d | .7515 d | .6672 i | .8161 d | .9790 i | .9895 i | .9711 i | .7925 d | .7313 d |
| VIE | .9021 d | .8506 d | .8896 d | .7908 d | .8323 d | .8752 i | .8719 i | .8138 i | .8002 d | .7451 d |
| NCL | .7256 d | .8440 d | .7556 d | .6402 i | .8299 d | .9875 i | .9342 i | .9350 i | .7699 d | .6993 d |
| MAN | .8064 d | .8021 d | .8378 d | .7372 d | .7531 d | .7901 i | .7688 i | .8742 i | .7946 d | .8434 d |
| **ADP** | **.8464 d** | **.7819 d** | **.8222 d** | **.7791 d** | **.7545 d** | **.7966 d** | **.7871 d** | **.8076 d** | **.7851 d** | **.7973 d** |
| DUS | * | * | * | * | .7364 d | .7826 i | .8069 i | .7630 i | .7739 d | .8104 d |
| FRA | .8262 d | .7686 d | .8155 d | .7775 d | .7473 d | .7618 d | .7664 d | .7325 d | .7406 d | .7417 d |
| BRU | * | * | .8513 d | .6798 d | .7174 d | .7945 i | .7914 i | .7852 i | .7668 d | .7486 d |
| ZRH | .8749 d | .8138 d | .8513 d | .6894 d | .7166 d | .7679 i | .7364 i | .7062 i | .6867 d | .7190 d |
| HAM | .8555 d | .8028 d | .8296 d | .7263 d | .7284 d | .7768 i | .7556 i | .6730 i | .7002 d | .7131 d |
| ADR | .8090 d | .7994 d | .8345 d | .7634 d | .7282 d | .7567 i | .7386 i | .6914 i | .7038 d | .7195 d |
| BRS | .7642 i | .8176 d | .4835 i | .6417 i | .7429 d | .9173 i | .8694 i | .8439 i | .6856 i | .6233 d |
| HAJ | .6575 d | .6572 d | .7569 d | .6084 d | .7293 d | .8184 i | .7887 i | .7189 i | .7269 d | .7097 d |
| CGN | .7342 d | .6649 d | .8533 d | .5401 d | .6834 d | .7423 i | .7349 i | .7037 i | .6867 d | .6786 d |
| GVA | .6030 d | .7552 d | .7292 d | .5594 d | .7209 d | .7648 i | .7470 i | .7228 i | .6884 d | .6833 d |
| NAP | .6668 i | .6570 d | .6402 i | .6002 i | .6746 d | .8166 i | .8175 i | .8141 i | .6432 d | .5635 d |
| LTN | * | * | .7164 d | .5837 i | .6443 d | .7577 i | .7213 i | .7475 i | .6531 d | .6031 d |
| BSL | .6178 d | .6331 d | .6361 d | .5582 i | .6281 d | .7180 i | .7340 i | .8130 i | .6549 d | .5948 d |
| MRS | .5873 d | .6122 d | .5669 d | .4912 i | .6283 d | .7059 i | .7133 i | .6617 i | .6226 d | .6359 d |
| **BER** | **.6978 d** | **.5104 d** | **.6898 d** | **.5539 d** | **.5960 d** | **.5959 i** | * | * | * | * |
| STN | .8430 d | .7694 d | .6686 d | .4055 d | .4490 d | .5009 i | .4362 i | .3323 i | .2892 d | 1 c |
| **Total Sample** | | | | | | | | | | |
| Average Efficiency | .82615 | .81282 | .81110 | .72277 | .76456 | .83905 | .83416 | .80844 | .76241 | .76754 |
| Minimum Efficiency | .58734 | .51045 | .48346 | .40549 | .44896 | .50086 | .43618 | .33232 | .28915 | .56347 |
| Standard Deviation | .12010 | .12319 | .12861 | .15558 | .11670 | .11920 | .12149 | .13283 | .13717 | .12402 |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
The BAA Group is excluded from calculation of average efficiency to avoid double counting.

| | |
|---|---|
| Airports in the British Isles = yellow | Airport Systems = **bold** |
| Score of Decision Making Units (DMU) | min. score = 0.xxxxx; max. score = 1.0 |
| Returns to Scale (RTS) | i = increasing; c = constant; d = decreasing |

Table B.5.4: DEA Results (Scores), CCR-i-Sub Model 'Financial Efficiency' (ranking according to long-term average score)

| Airport /Group | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| LHR | .7708 | .8075 | .7450 | .7008 | .8882 | 1 | 1 | 1 | .9246 | .7967 |
| CWL | .9828 | 1 | .9050 | .7698 | 1 | .8596 | .8656 | .7713 | .6717 | .6077 |
| BFS | 1 | .9419 | 1 | .7601 | .6999 | .7792 | .8519 | .7693 | .7190 | .6529 |
| EMA | .8805 | .8165 | .8106 | .6838 | .8003 | .8863 | .8508 | .7784 | 1 | .6631 |
| ABZ | .8092 | .7838 | .7535 | .6471 | .7646 | .9035 | .9302 | .8911 | .7902 | .7013 |
| **BAA** | **.6776** | **.7347** | **.6940** | **.6410** | **.8195** | **.9602** | **.9245** | **.8806** | **.7776** | **.7336** |
| EDI | .7737 | .7601 | .6829 | .6326 | .7609 | .9166 | .9364 | .8893 | .7696 | .6606 |
| LGW | .7894 | .7733 | .6976 | .6362 | .7264 | .8724 | .8584 | .8414 | .7927 | .7337 |
| GLA | .7381 | .6964 | .6128 | .5794 | .6817 | .9326 | .9757 | .8304 | .8585 | .7747 |
| BHX | .7632 | .7414 | .7046 | 1 | .7644 | .8558 | .7798 | .7455 | .6882 | .6356 |
| NCL | .7163 | .7708 | .7120 | .5881 | .7747 | .9249 | .8809 | .8554 | .7551 | .6586 |
| CPH | .7532 | .7648 | .7345 | .6252 | .7695 | .8789 | .8434 | .7855 | .7062 | .5935 |
| AMS | .7593 | .7751 | .7451 | .6111 | .7347 | .8404 | .8147 | .7779 | .7085 | .6222 |
| **RIA** | **.6653** | **.7141** | **.6985** | **.6060** | **.7306** | **.8490** | **.8185** | **.7780** | **.7599** | **.7120** |
| VIE | .7221 | .6978 | .6814 | .5892 | .7426 | .8686 | .8660 | .8051 | .7454 | .6049 |
| DUS | * | * | * | * | .6571 | .7769 | .8016 | .7556 | .7191 | .6520 |
| LBA | .7110 | .7081 | .6819 | .5457 | .6200 | .7761 | .8093 | .7642 | .7520 | .7253 |
| MAN | .6409 | .6559 | .6386 | .5573 | .6729 | .7840 | .7635 | .8648 | .7391 | .6828 |
| BRS | .7630 | .7756 | .4794 | .5694 | .7053 | .8366 | .8046 | .7513 | .6659 | .6127 |
| BRU | * | * | .6774 | .5729 | .6457 | .7759 | .7713 | .7527 | .7290 | .6388 |
| HAM | .7026 | .6686 | .6528 | .5810 | .6528 | .7664 | .7464 | .6599 | .6555 | .5854 |
| **ADP** | **.6434** | **.6248** | **.6125** | **.5318** | **.6441** | **.7828** | **.7640** | **.7509** | **.6934** | **.6152** |
| ZRH | .7093 | .6745 | .6602 | .5358 | .6415 | .7587 | .7279 | .6937 | .6417 | .5862 |
| ADR | .6341 | .6495 | .6269 | .5444 | .6479 | .7550 | .7371 | .6909 | .6512 | .5748 |
| NAP | .6640 | .6283 | .6213 | .5262 | .6466 | .7369 | .7500 | .7328 | .6397 | .5578 |
| HAJ | .5609 | .5601 | .6146 | .5427 | .6598 | .7968 | .7681 | .6875 | .6907 | .5943 |
| GVA | .5249 | .6516 | .6082 | .5149 | .6523 | .7440 | .7277 | .6949 | .6511 | .5736 |
| FRA | .6263 | .6096 | .6012 | .5207 | .6249 | .7402 | .7316 | .6758 | .6354 | .5683 |
| LTN | * | * | .6411 | .5467 | .6044 | .7029 | .6771 | .6857 | .6315 | .5274 |
| CGN | .6060 | .5568 | .6751 | .4374 | .6135 | .7290 | .7224 | .6855 | .6459 | .5674 |
| BSL | .5966 | .5887 | .6160 | .5182 | .5856 | .6680 | .6864 | .7346 | .6460 | .5675 |
| MRS | .5670 | .5560 | .5323 | .4674 | .5801 | .6666 | .6786 | .6125 | .6051 | .5660 |
| STN | .7063 | .6547 | .5597 | .3933 | .4104 | .4789 | .4173 | .3058 | .2833 | 1 |
| **BER** | **.5791** | **.4275** | **.5435** | **.4453** | **.5344** | **.5872** | * | * | * | * |
| LPL | .5037 | .5484 | .5359 | .4525 | .4503 | .5099 | .5232 | .5916 | .5454 | .5219 |
| **Total Sample** | | | | | | | | | | |
| Average Efficiency | .70526 | .69621 | .66854 | .58282 | .67905 | .78650 | .78425 | .74575 | .70031 | .64045 |
| Minimum Efficiency | .50373 | .42754 | .47940 | .39332 | .41039 | .47886 | .41728 | .30583 | .28332 | .52192 |
| Standard Deviation | .11304 | .11362 | .10013 | .11036 | .10964 | .11424 | .11439 | .11416 | .11437 | .09179 |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98
The BAA Group is excluded from calculation of average efficiency to avoid double counting.

| | |
|---|---|
| Airports in the British Isles = yellow | Airport Systems = **bold** |
| Score of Decision Making Units (DMU) | min. score = 0.xxxxx; max. score = 1.0 |

Table B.5.5: DEA Results (Scale Scores and Returns to Scale), CCR-i / BCC-i-Sub Model 'Financial Efficiency' (ranking according to long-term average score)

| Airport /Group | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| NAP | .9958 i | .9562 d | .9705 i | .8768 i | .9585 d | .9024 i | .9174 i | .9002 i | .9945 d | .9899 d |
| BRS | .9984 i | .9485 d | .9916 i | .8872 i | .9493 d | .9120 i | .9255 i | .8903 i | .9713 i | .9829 d |
| ABZ | .9939 i | .9504 d | .9952 i | .8962 i | .9490 d | .9171 i | .9324 i | .8961 i | .9865 d | .9357 d |
| BSL | .9656 d | .9299 d | .9684 d | .9283 i | .9323 d | .9303 i | .9351 i | .9037 i | .9865 d | .9541 d |
| BFS | 1 c | .9419 d | 1 c | .8942 i | .9468 d | .9154 i | .9302 i | .9055 i | .9797 d | .9149 d |
| EMA | .9972 i | .9461 d | .9885 i | .8820 i | .9471 d | .9127 i | .9045 i | .8797 i | 1 c | .9610 d |
| NCL | .9872 d | .9133 d | .9422 d | .9187 i | .9334 d | .9366 i | .9430 i | .9148 i | .9808 d | .9418 d |
| MRS | .9653 d | .9082 d | .9389 d | .9516 i | .9232 d | .9444 i | .9513 i | .9257 i | .9719 d | .8900 d |
| DUS | * | * | * | * | .8923 d | .9928 i | .9934 i | .9903 i | .9292 d | .8046 d |
| EDI | .9308 d | .8999 d | .9087 d | .9481 i | .9324 d | .9363 i | .9464 i | .9158 i | .9711 d | .9033 d |
| LTN | * | * | .8949 d | .9366 i | .9381 d | .9278 i | .9387 i | .9174 i | .9669 d | .8744 d |
| STN | .8378 d | .8510 d | .8371 d | .9700 d | .9141 d | .9561 i | .9567 i | .9203 i | .9798 d | 1 c |
| GLA | .8714 d | .8633 d | .8361 d | .9787 d | .9093 d | .9732 i | .9771 i | .9620 i | .9459 d | .8427 d |
| BHX | .8461 d | .8490 d | .8151 d | 1 c | .9112 d | .9663 i | .9688 i | .9534 i | .9495 d | .8490 d |
| GVA | .8706 d | .8629 d | .8341 d | .9206 d | .9048 d | .9728 i | .9742 i | .9614 i | .9458 d | .8395 d |
| BRU | * | * | .7958 d | .8428 d | .9001 d | .9766 i | .9746 i | .9587 i | .9506 d | .8533 d |
| HAJ | .8532 d | .8523 d | .8121 d | .8920 d | .9047 d | .9736 i | .9739 i | .9564 i | .9501 d | .8375 d |
| CGN | .8254 d | .8373 d | .7911 d | .8099 d | .8977 d | .9821 i | .9830 i | .9741 i | .9405 d | .8361 d |
| HAM | .8213 d | .8329 d | .7869 d | .8000 d | .8962 d | .9867 i | .9879 i | .9805 i | .9361 d | .8210 d |
| CPH | .8112 d | .8283 d | .7796 d | .7862 d | .8968 d | .9837 i | .9850 i | .9812 i | .9356 d | .8176 d |
| ZRH | .8108 d | .8288 d | .7756 d | .7771 d | .8951 d | .9881 i | .9885 i | .9823 i | .9346 d | .8152 d |
| VIE | .8005 d | .8204 d | .7660 d | .7450 d | .8922 d | .9926 i | .9932 i | .9893 i | .9314 d | .8119 d |
| MAN | .7948 d | .8177 d | .7623 d | .7559 d | .8935 d | .9923 i | .9932 i | .9893 i | .9302 d | .8095 d |
| **RIA** | **.7959 d** | **.8193 d** | **.7628 d** | **.7488 d** | **.8929 d** | **.9918 i** | **.9922 i** | **.9889 i** | **.9308 d** | **.8096 d** |
| LGW | .7894 d | .8134 d | .7547 d | .7308 d | .8916 d | .9943 i | .9953 i | .9925 i | .9280 d | .8025 d |
| AMS | .7846 d | .8129 d | .7544 d | .7232 d | .8904 d | .9965 i | .9970 i | .9948 i | .9280 d | .8035 d |
| ADR | .7838 d | .8125 d | .7513 d | .7131 d | .8897 d | .9978 i | .9980 i | .9992 i | .9253 d | .7989 d |
| LHR | .7708 d | .8075 d | .7450 d | .7008 d | .8882 d | 1 c | 1 c | 1 c | .9246 d | .7967 d |
| **BER** | **.8300 d** | **.8376 d** | **.7880 d** | **.8040 d** | **.8966 d** | **.9854 i** | * | * | * | * |
| CWL | .9828 i | 1 c | .9050 i | .7698 i | 1 c | .8596 i | .8656 i | .7713 i | .6717 i | .6077 i |
| **ADP** | **.7602 d** | **.7991 d** | **.7450 d** | **.6826 d** | **.8537 d** | **.9827 d** | **.9707 d** | **.9298 d** | **.8832 d** | **.7716 d** |
| FRA | .7581 d | .7931 d | .7372 d | .6697 d | .8362 d | .9717 d | .9546 d | .9226 d | .8580 d | .7662 d |
| LBA | .8632 i | .9495 i | .8093 i | .6833 i | .7349 i | .7761 i | .8093 i | .7824 i | .7520 i | .7253 i |
| **BAA** | **.6776 d** | **.7347 d** | **.6940 d** | **.6410 d** | **.8195 d** | **.9602 d** | **.9245 d** | **.8806 d** | **.7776 d** | **.7336 d** |
| LPL | .5249 i | .5484 i | .5359 i | .4525 i | .4503 i | .5099 i | .5232 i | .5916 i | .6504 i | .6119 i |
| **Total Sample** | | | | | | | | | | |
| Average Efficiency | .85873 | .85909 | .83270 | .82050 | .89243 | .94228 | .94484 | .92792 | .92486 | .84181 |
| Minimum Efficiency | .52495 | .54835 | .53592 | .45252 | .45025 | .50987 | .52323 | .59156 | .65045 | .60769 |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98

The BAA Group is excluded from calculation of average efficiency to avoid double counting.

| | |
|---|---|
| Airports in the British Isles = yellow | Airport Systems = **bold** |
| Score of Decision Making Units (DMU) | min. score = 0.xxxxx; max. score = 1.0 |
| Returns to Scale (RTS) | i = increasing; c = constant; d = decreasing |

Table B.5.6: DEA Results BCC-i-Sub Model 'Financial Efficiency' and Ownership Structure 1990-1999 (ranked per annual score, returns to scale and alphabetical order)

| Rank | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CWL | LPL | CWL | CWL | LPL | CWL | CWL | CWL | CWL | CWL |
| 2 | BFS | CWL | LPL | LPL | CWL | LBA | LBA | LPL | LBA | LBA |
| 3 | **BAA** | BFS | BFS | BHX | **BAA** | LPL | LPL | LHR | EMA | STN |
| 4 | LGW | **BAA** | **BAA** | **BAA** | LHR | LHR | LHR | **BAA** | **BAA** | **BAA** |
| 5 | LHR | LHR | LHR | LHR | CPH | **BAA** | **BAA** | ABZ | LHR | LHR |
| 6 | AMS | AMS | AMS | LGW | EMA | NCL | GLA | LBA | GLA | GLA |
| 7 | LPL | LGW | CPH | BFS | LBA | ABZ | ABZ | EDI | LGW | LGW |
| 8 | CPH | CPH | LGW | AMS | BHX | EDI | EDI | NCL | LPL | **RIA** |
| 9 | VIE | BHX | **RIA** | **RIA** | VIE | EMA | EMA | EMA | **RIA** | LPL |
| 10 | BHX | **RIA** | VIE | LBA | NCL | GLA | NCL | MAN | ABZ | MAN |
| 11 | EMA | EMA | BHX | CPH | AMS | BRS | BFS | GLA | VIE | DUS |
| 12 | ZRH | VIE | CGN | VIE | **RIA** | CPH | VIE | BFS | MAN | **ADP** |
| 13 | HAM | EDI | BRU | **ADP** | EDI | BHX | BRS | LGW | EDI | AMS |
| 14 | GLA | NCL | ZRH | FRA | LGW | LGW | LGW | BRS | **ADP** | ABZ |
| 15 | **ADP** | ABZ | LBA | EMA | ABZ | VIE | CPH | NAP | DUS | BHX |
| 16 | STN | BRS | MAN | ADR | **ADP** | **RIA** | **RIA** | VIE | NCL | BRU |
| 17 | **RIA** | ZRH | ADR | MAN | MAN | BFS | NAP | BSL | BRU | VIE |
| 18 | EDI | GLA | HAM | HAM | GLA | AMS | AMS | **ADP** | AMS | FRA |
| 19 | FRA | HAM | **ADP** | ABZ | FRA | HAJ | DUS | CPH | CPH | EDI |
| 20 | LBA | MAN | EMA | ZRH | BRS | NAP | BHX | **RIA** | FRA | CPH |
| 21 | ABZ | ADR | FRA | BRU | BFS | **ADP** | BRU | BRU | BFS | ADR |
| 22 | ADR | **ADP** | ABZ | EDI | DUS | BRU | HAJ | BHX | HAJ | ZRH |
| 23 | MAN | STN | HAJ | BRS | HAJ | MAN | **ADP** | AMS | BHX | BFS |
| 24 | BRS | FRA | NCL | NCL | HAM | DUS | MAN | DUS | ADR | HAM |
| 25 | CGN | GVA | EDI | HAJ | ADR | HAM | FRA | LTN | HAM | HAJ |
| 26 | NCL | LBA | GLA | NAP | GVA | ZRH | HAM | FRA | GVA | NCL |
| 27 | **BER** | CGN | GVA | GLA | BRU | GVA | GVA | GVA | CGN | EMA |
| 28 | NAP | HAJ | LTN | LTN | ZRH | FRA | ADR | HAJ | ZRH | GVA |
| 29 | HAJ | NAP | **BER** | GVA | CGN | LTN | ZRH | ZRH | BRS | CGN |
| 30 | BSL | BSL | STN | BSL | NAP | ADR | CGN | CGN | BSL | MRS |
| 31 | GVA | MRS | NAP | **BER** | LTN | CGN | BSL | ADR | LTN | BRS |
| 32 | MRS | **BER** | BSL | CGN | MRS | BSL | LTN | HAM | NAP | LTN |
| 33 | * | * | MRS | MRS | BSL | MRS | MRS | MRS | MRS | BSL |
| 34 | * | * | BRS | STN | **BER** | **BER** | STN | STN | STN | NAP |
| 35 | * | * | * | * | STN | STN | * | * | * | * |
| **TOTAL** | **.82615** | **.81282** | **.81110** | **.72277** | **.76456** | **.83905** | **.83416** | **.80844** | **.76241** | **.76754** |
| Publicly | .77161 | .75427 | .77000 | .66858 | .72646 | .80744 | .81065 | .79517 | .75771 | .73602 |
| Partially | .80430 | .79693 | .83416 | .86203 | .84307 | .88477 | .83840 | .79790 | .72480 | .74860 |
| Fully | .91781 | .90591 | .86415 | .77840 | .81243 | .89177 | .89070 | .84925 | .78123 | .86446 |

*BER 1994-1999; BRU 1990-1997; DUS 1990-1995; LTN 1990/91-1997/98

The BAA Group is excluded from fully priv. and total sample averages to avoid double counting.

Colours = degree of privatisation:

• publicly owned; • partially privatised; • fully privatised; • **airport systems**

## Appendix B.6: Historical Share Prices

| Start ➤ | 1 Jan 98 | 1 Jan 98 | 1 Jan 98 | 1 Jan 98 | 1 Jan 98 | Start ➤ | 15 Nov 00 | Start ➤ | 8 Jun 01 |
|---|---|---|---|---|---|---|---|---|---|
| End ➤ | 29 Mar 01 | 26 Dec 02 | 26 Dec 02 | 26 Dec 02 | 26 Dec 02 | End ➤ | 25 Dec 02 | End ➤ | 27 Dec 02 |
| Frequency ➤ | Weekly | Weekly | Weekly | Weekly | Weekly | Frequency ➤ | Weekly | Frequency ➤ | Weekly |
| Name ➤ | Aeroporti di Roma (ADR) Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Name ➤ | Flughafen Zurich | Name ➤ | FRAPORT |
| Code ➤ | 892328(P) | 953553(P) | 142388(P) | 901591(P) | 307594(P) | Code ➤ | 729478(P) | Code ➤ | 13922L(P) |
| Currency ➤ | EUR | GBP (p) | DKK | GBP (p) | EUR | Currency ➤ | CHF | Currency ➤ | EUR |
| 1/1/98 | 4.74 | 498 | 824 | 93.25 | 36.48 | n/a | n/a | n/a | n/a |
| 1/8/98 | 4.83 | 491.5 | 832 | 95.25 | 37.14 | n/a | n/a | n/a | n/a |
| 1/15/98 | 5.41 | 462 | 794 | 95.75 | 38.52 | n/a | n/a | n/a | n/a |
| 1/22/98 | 5.8 | 465 | 796 | 95.75 | 37.94 | n/a | n/a | n/a | n/a |
| 1/29/98 | 5.98 | 485 | 806 | 99 | 39.17 | n/a | n/a | n/a | n/a |
| 2/5/98 | 6.04 | 517 | 793 | 98.25 | 39.1 | n/a | n/a | n/a | n/a |
| 2/12/98 | 6.03 | 532 | 767 | 100.25 | 38.7 | n/a | n/a | n/a | n/a |
| 2/19/98 | 5.97 | 561 | 752 | 100 | 38.59 | n/a | n/a | n/a | n/a |
| 2/26/98 | 5.94 | 558.5 | 740 | 97.75 | 37.21 | n/a | n/a | n/a | n/a |
| 3/5/98 | 6.18 | 556 | 740 | 95.5 | 37.79 | n/a | n/a | n/a | n/a |
| 3/12/98 | 6.78 | 586.5 | 785 | 100 | 37.57 | n/a | n/a | n/a | n/a |
| 3/19/98 | 7.27 | 606 | 790 | 98.75 | 41.42 | n/a | n/a | n/a | n/a |
| 3/26/98 | 8.24 | 566.5 | 848 | 97.5 | 41.06 | n/a | n/a | n/a | n/a |
| 4/2/98 | 8.22 | 603 | 826 | 96 | 42.88 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 4/9/98 | 7.37 | 637 | 852 | 94 | 43.09 | n/a | n/a | n/a | n/a |
| 4/16/98 | 7.94 | 633 | 854 | 97 | 42.91 | n/a | n/a | n/a | n/a |
| 4/23/98 | 7.15 | 617.5 | 839 | 97 | 42.3 | n/a | n/a | n/a | n/a |
| 4/30/98 | 6.4 | 608.5 | 816 | 99.75 | 40.73 | n/a | n/a | n/a | n/a |
| 5/7/98 | 6.34 | 606 | 838 | 105 | 41.71 | n/a | n/a | n/a | n/a |
| 5/14/98 | 6.17 | 640 | 856 | 106 | 43.86 | n/a | n/a | n/a | n/a |
| 5/21/98 | 6.39 | 654.5 | 830 | 108.25 | 44.94 | n/a | n/a | n/a | n/a |
| 5/28/98 | 6.12 | 702 | 845 | 109.5 | 47.75 | n/a | n/a | n/a | n/a |
| 6/4/98 | 6.79 | 696 | 840 | 114.5 | 47.73 | n/a | n/a | n/a | n/a |
| 6/11/98 | 6.74 | 700 | 839 | 119.75 | 45.86 | n/a | n/a | n/a | n/a |
| 6/18/98 | 6.28 | 661 | 835 | 121.25 | 43.85 | n/a | n/a | n/a | n/a |
| 6/25/98 | 5.87 | 666 | 823 | 129.5 | 44.69 | n/a | n/a | n/a | n/a |
| 7/2/98 | 6.19 | 650 | 836 | 126.25 | 44.53 | n/a | n/a | n/a | n/a |
| 7/9/98 | 6.44 | 664.5 | 904 | 121.25 | 43.95 | n/a | n/a | n/a | n/a |
| 7/16/98 | 6.41 | 665 | 887 | 114.75 | 43.89 | n/a | n/a | n/a | n/a |
| 7/23/98 | 5.99 | 679 | 839 | 118.25 | 44.55 | n/a | n/a | n/a | n/a |
| 7/30/98 | 5.91 | 664 | 830 | 117.5 | 43.39 | n/a | n/a | n/a | n/a |
| 8/6/98 | 6.09 | 669 | 805 | 113 | 42.91 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 8/13/98 | 6.51 | 634.5 | 735 | 109.75 | 39.97 | n/a | n/a | n/a | n/a |
| 8/20/98 | 6.13 | 666.5 | 773 | 102.75 | 42 | n/a | n/a | n/a | n/a |
| 8/27/98 | 5.83 | 611 | 750 | 98.25 | 36.87 | n/a | n/a | n/a | n/a |
| 9/3/98 | 5.41 | 605 | 750 | 89.75 | 34.34 | n/a | n/a | n/a | n/a |
| 9/10/98 | 5.84 | 566.5 | 770 | 100.25 | 36.23 | n/a | n/a | n/a | n/a |
| 9/17/98 | 5.74 | 596 | 755 | 95.5 | 35.08 | n/a | n/a | n/a | n/a |
| 9/24/98 | 5.78 | 603.5 | 782 | 90.5 | 35.76 | n/a | n/a | n/a | n/a |
| 10/1/98 | 5.22 | 598 | 762 | 96 | 32.48 | n/a | n/a | n/a | n/a |
| 10/8/98 | 4.65 | 618 | 729 | 96.75 | 34.52 | n/a | n/a | n/a | n/a |
| 10/15/98 | 5.12 | 651.5 | 728 | 93.75 | 37.57 | n/a | n/a | n/a | n/a |
| 10/22/98 | 5.14 | 651 | 720 | 91.5 | 38.12 | n/a | n/a | n/a | n/a |
| 10/29/98 | 5.16 | 674.5 | 710 | 91.5 | 37.93 | n/a | n/a | n/a | n/a |
| 11/5/98 | 5.68 | 648.5 | 770 | 98 | 40.3 | n/a | n/a | n/a | n/a |
| 11/12/98 | 6.24 | 625 | 777 | 95.75 | 38.15 | n/a | n/a | n/a | n/a |
| 11/19/98 | 6.25 | 677 | 733 | 93 | 37.21 | n/a | n/a | n/a | n/a |
| 11/26/98 | 7.17 | 665 | 721 | 96.25 | 38.48 | n/a | n/a | n/a | n/a |
| 12/3/98 | 7.23 | 692 | 717 | 96 | 39.81 | n/a | n/a | n/a | n/a |
| 12/10/98 | 7.02 | 678 | 718 | 93.75 | 37.79 | n/a | n/a | n/a | n/a |
| 12/17/98 | 7.1 | 668 | 750 | 97.25 | 40.04 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 12/24/98 | 7.2 | 694 | 776 | 97.25 | 39.93 | n/a | n/a | n/a | n/a |
| 12/31/98 | 7.44 | 701.5 | 788 | 97.25 | 41.81 | n/a | n/a | n/a | n/a |
| 1/7/99 | 7.29 | 700 | 828 | 100.5 | 43.9 | n/a | n/a | n/a | n/a |
| 1/14/99 | 7.2 | 726.5 | 790 | 94 | 40 | n/a | n/a | n/a | n/a |
| 1/21/99 | 7.33 | 697 | 796 | 92 | 36 | n/a | n/a | n/a | n/a |
| 1/28/99 | 7.25 | 702.5 | 785 | 90.5 | 37.75 | n/a | n/a | n/a | n/a |
| 2/4/99 | 7.37 | 757 | 770 | 90.25 | 41.2 | n/a | n/a | n/a | n/a |
| 2/11/99 | 7.13 | 730.5 | 755 | 90.5 | 38.4 | n/a | n/a | n/a | n/a |
| 2/18/99 | 6.93 | 731 | 725 | 89.75 | 39.6 | n/a | n/a | n/a | n/a |
| 2/25/99 | 7.6 | 707.5 | 716 | 89.25 | 38.44 | n/a | n/a | n/a | n/a |
| 3/4/99 | 7.57 | 701 | 704 | 88.25 | 38.15 | n/a | n/a | n/a | n/a |
| 3/11/99 | 7.64 | 713 | 699 | 89.5 | 38.06 | n/a | n/a | n/a | n/a |
| 3/18/99 | 7.59 | 639.5 | 707 | 89.5 | 37.8 | n/a | n/a | n/a | n/a |
| 3/25/99 | 7.45 | 688.5 | 733 | 88.75 | 37.46 | n/a | n/a | n/a | n/a |
| 4/1/99 | 7.3 | 682.5 | 732 | 86.5 | 38.91 | n/a | n/a | n/a | n/a |
| 4/8/99 | 7.46 | 678.5 | 730 | 87.5 | 38.99 | n/a | n/a | n/a | n/a |
| 4/15/99 | 7.12 | 649 | 735 | 88.5 | 39.89 | n/a | n/a | n/a | n/a |
| 4/22/99 | 6.89 | 636 | 735 | 93.75 | 38.06 | n/a | n/a | n/a | n/a |
| 4/29/99 | 6.95 | 643.5 | 709 | 92 | 41.85 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 5/6/99 | 6.66 | 634.5 | 700 | 91.75 | 41 | n/a | n/a | n/a | n/a |
| 5/13/99 | 6.72 | 660.5 | 671 | 97.5 | 41.6 | n/a | n/a | n/a | n/a |
| 5/20/99 | 6.2 | 659 | 640 | 99 | 42.3 | n/a | n/a | n/a | n/a |
| 5/27/99 | 6.05 | 675 | 626 | 98.75 | 40.77 | n/a | n/a | n/a | n/a |
| 6/3/99 | 6.53 | 696 | 635 | 99 | 41.91 | n/a | n/a | n/a | n/a |
| 6/10/99 | 6.39 | 655 | 650 | 97 | 42.75 | n/a | n/a | n/a | n/a |
| 6/17/99 | 6.25 | 649.5 | 627 | 97 | 41.59 | n/a | n/a | n/a | n/a |
| 6/24/99 | 6.03 | 633 | 615.14 | 97.75 | 40.05 | n/a | n/a | n/a | n/a |
| 7/1/99 | 6.05 | 619.5 | 684.12 | 94.5 | 40.91 | n/a | n/a | n/a | n/a |
| 7/8/99 | 6.35 | 634 | 694.16 | 96.5 | 40.3 | n/a | n/a | n/a | n/a |
| 7/15/99 | 6.36 | 624 | 713.36 | 94.75 | 41 | n/a | n/a | n/a | n/a |
| 7/22/99 | 6.58 | 618.5 | 688.62 | 92.25 | 40.5 | n/a | n/a | n/a | n/a |
| 7/29/99 | 7.03 | 630 | 686.81 | 93.5 | 39.9 | n/a | n/a | n/a | n/a |
| 8/5/99 | 6.83 | 622.5 | 683.79 | 89.25 | 38.36 | n/a | n/a | n/a | n/a |
| 8/12/99 | 6.9 | 645 | 684.88 | 87 | 38.29 | n/a | n/a | n/a | n/a |
| 8/19/99 | 6.94 | 637 | 660.48 | 93.5 | 38.4 | n/a | n/a | n/a | n/a |
| 8/26/99 | 7.23 | 640 | 639 | 95.75 | 38.47 | n/a | n/a | n/a | n/a |
| 9/2/99 | 7.13 | 642 | 626.12 | 95.5 | 38 | n/a | n/a | n/a | n/a |
| 9/9/99 | 7.26 | 636 | 628.26 | 94.5 | 39.34 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 9/16/99 | 6.99 | 636.5 | 630.42 | 89 | 38.15 | n/a | n/a | n/a | n/a |
| 9/23/99 | 7.04 | 625 | 585.75 | 88.5 | 37.1 | n/a | n/a | n/a | n/a |
| 9/30/99 | 6.98 | 615 | 566.89 | 81.75 | 37.47 | n/a | n/a | n/a | n/a |
| 10/7/99 | 6.88 | 470.5 | 590.63 | 80.5 | 35.9 | n/a | n/a | n/a | n/a |
| 10/14/99 | 6.75 | 434.5 | 597.39 | 75.75 | 35.35 | n/a | n/a | n/a | n/a |
| 10/21/99 | 6.61 | 430 | 571.86 | 75.75 | 33.72 | n/a | n/a | n/a | n/a |
| 10/28/99 | 6.8 | 438.5 | 584.58 | 71.25 | 33.1 | n/a | n/a | n/a | n/a |
| 11/4/99 | 6.62 | 462 | 604.97 | 77.5 | 34.64 | n/a | n/a | n/a | n/a |
| 11/11/99 | 6.7 | 436 | 611.03 | 72.5 | 34.15 | n/a | n/a | n/a | n/a |
| 11/18/99 | 6.52 | 479.5 | 628.94 | 74.5 | 33.97 | n/a | n/a | n/a | n/a |
| 11/25/99 | 6.32 | 460 | 630.92 | 71.75 | 35.28 | n/a | n/a | n/a | n/a |
| 12/2/99 | 6.8 | 437.5 | 621.48 | 76.5 | 34.9 | n/a | n/a | n/a | n/a |
| 12/9/99 | 6.47 | 436.5 | 620.3 | 75.5 | 35.59 | n/a | n/a | n/a | n/a |
| 12/16/99 | 6.4 | 435 | 634.45 | 76.5 | 34.5 | n/a | n/a | n/a | n/a |
| 12/23/99 | 6.33 | 421.25 | 602.46 | 76 | 34.5 | n/a | n/a | n/a | n/a |
| 12/30/99 | 6.48 | 435 | 594.87 | 75.25 | 34.51 | n/a | n/a | n/a | n/a |
| 1/6/00 | 6.4 | 438.75 | 576.9 | 81.5 | 34.95 | n/a | n/a | n/a | n/a |
| 1/13/00 | 6.29 | 417.75 | 581.4 | 94.25 | 38.65 | n/a | n/a | n/a | n/a |
| 1/20/00 | 6.7 | 397 | 578.31 | 86.75 | 39.97 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 1/27/00 | 6.95 | 371.5 | 578.08 | 90 | 38.7 | n/a | n/a | n/a | n/a |
| 2/3/00 | 7.25 | 416.25 | 567.87 | 84.25 | 37.39 | n/a | n/a | n/a | n/a |
| 2/10/00 | 7.15 | 396 | 596.08 | 76.25 | 37.7 | n/a | n/a | n/a | n/a |
| 2/17/00 | 6.93 | 398 | 593.74 | 73.75 | 37.58 | n/a | n/a | n/a | n/a |
| 2/24/00 | 7.03 | 392 | 597.42 | 73.25 | 37.7 | n/a | n/a | n/a | n/a |
| 3/2/00 | 7.07 | 383.5 | 589.77 | 70.25 | 37.5 | n/a | n/a | n/a | n/a |
| 3/9/00 | 7 | 358.25 | 557.35 | 70.25 | 37.5 | n/a | n/a | n/a | n/a |
| 3/16/00 | 7 | 410.75 | 539.57 | 54.5 | 36.3 | n/a | n/a | n/a | n/a |
| 3/23/00 | 7.08 | 445.75 | 565.37 | 58.5 | 36.2 | n/a | n/a | n/a | n/a |
| 3/30/00 | 6.91 | 389.25 | 540.22 | 56.5 | 38 | n/a | n/a | n/a | n/a |
| 4/6/00 | 7.2 | 392 | 548.03 | 52.5 | 38.15 | n/a | n/a | n/a | n/a |
| 4/13/00 | 7.45 | 386.75 | 543.13 | 53.75 | 36.49 | n/a | n/a | n/a | n/a |
| 4/20/00 | 7.68 | 404.25 | 532.59 | 56.25 | 35.25 | n/a | n/a | n/a | n/a |
| 4/27/00 | 7.69 | 410 | 541.02 | 67.25 | 35.75 | n/a | n/a | n/a | n/a |
| 5/4/00 | 7.76 | 409.5 | 549.56 | 65.5 | 35.7 | n/a | n/a | n/a | n/a |
| 5/11/00 | 7.81 | 495 | 554.78 | 62.5 | 34.45 | n/a | n/a | n/a | n/a |
| 5/18/00 | 8.15 | 485 | 537.73 | 61.25 | 35.31 | n/a | n/a | n/a | n/a |
| 5/25/00 | 8.05 | 491.25 | 535.76 | 58.75 | 35.6 | n/a | n/a | n/a | n/a |
| 6/1/00 | 8.2 | 490 | 547.55 | 61.75 | 35.95 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 6/8/00 | 8.4 | 508 | 545.8 | 63 | 36.88 | n/a | n/a | n/a | n/a |
| 6/15/00 | 8.78 | 499.75 | 564.53 | 65.25 | 36.3 | n/a | n/a | n/a | n/a |
| 6/22/00 | 8.75 | 492.5 | 569.98 | 63.25 | 36.35 | n/a | n/a | n/a | n/a |
| 6/29/00 | 8.89 | 510 | 565.51 | 75 | 36.98 | n/a | n/a | n/a | n/a |
| 7/6/00 | 8.9 | 526 | 565.54 | 76.25 | 36.5 | n/a | n/a | n/a | n/a |
| 7/13/00 | 8.91 | 529.5 | 573.11 | 79.25 | 35 | n/a | n/a | n/a | n/a |
| 7/20/00 | 8.89 | 528 | 619.55 | 77.25 | 34.3 | n/a | n/a | n/a | n/a |
| 7/27/00 | 8.97 | 520.5 | 576.83 | 77.25 | 34.99 | n/a | n/a | n/a | n/a |
| 8/3/00 | 8.99 | 544 | 653.53 | 78.25 | 36 | n/a | n/a | n/a | n/a |
| 8/10/00 | 9 | 552 | 687.59 | 88.25 | 37.25 | n/a | n/a | n/a | n/a |
| 8/17/00 | 8.99 | 544 | 687.37 | 88.75 | 35.41 | n/a | n/a | n/a | n/a |
| 8/24/00 | 8.99 | 568.5 | 689.56 | 95 | 40 | n/a | n/a | n/a | n/a |
| 8/31/00 | 9.02 | 550 | 660.01 | 92.75 | 38.61 | n/a | n/a | n/a | n/a |
| 9/7/00 | 9.03 | 542.5 | 698.06 | 95.25 | 38.96 | n/a | n/a | n/a | n/a |
| 9/14/00 | 9.03 | 533 | 660.87 | 90.5 | 39.76 | n/a | n/a | n/a | n/a |
| 9/21/00 | 9.05 | 524 | 714.69 | 89.25 | 40.75 | n/a | n/a | n/a | n/a |
| 9/28/00 | 9.08 | 520.5 | 682.61 | 85.75 | 41.08 | n/a | n/a | n/a | n/a |
| 10/5/00 | 9.07 | 557.5 | 690.83 | 94.25 | 40.85 | n/a | n/a | n/a | n/a |
| 10/12/00 | 9.09 | 574 | 689.89 | 81.25 | 39.45 | n/a | n/a | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 10/19/00 | 9.09 | 571 | 666.87 | 80.5 | 38.2 | n/a | n/a | n/a | n/a |
| 10/26/00 | 9.11 | 560.5 | 685.33 | 80.75 | 40.85 | n/a | n/a | n/a | n/a |
| 11/2/00 | 8.6 | 569.5 | 679.96 | 80 | 42 | n/a | n/a | n/a | n/a |
| 11/9/00 | 8.95 | 552 | 687.09 | 76.75 | 43.09 | n/a | n/a | n/a | n/a |
| 11/16/00 | 9.1 | 566 | 672.67 | 79.25 | 43 | 11/15/00 | 282 | n/a | n/a |
| 11/23/00 | 9 | 575 | 647.31 | 77.75 | 42.79 | 11/22/00 | 264 | n/a | n/a |
| 11/30/00 | 9.05 | 601 | 670.69 | 76 | 40.13 | 11/29/00 | 267 | n/a | n/a |
| 12/7/00 | 9.01 | 584.5 | 675.45 | 73 | 40.47 | 12/6/00 | 285 | n/a | n/a |
| 12/14/00 | 9 | 582 | 665.14 | 71.5 | 40.12 | 12/13/00 | 275 | n/a | n/a |
| 12/21/00 | 9.1 | 608 | 670.87 | 65.5 | 39.92 | 12/20/00 | 275 | n/a | n/a |
| 12/28/00 | 9.13 | 632 | 685.74 | 63.5 | 40.3 | 12/27/00 | 263 | n/a | n/a |
| ¼/01 | 9.06 | 600 | 690.96 | 66.75 | 38.38 | 1/3/01 | 275 | n/a | n/a |
| 1/11/01 | 9.08 | 593 | 740.07 | 64.75 | 38.42 | 1/10/01 | 270 | n/a | n/a |
| 1/18/01 | 9.09 | 584 | 734.72 | 65.75 | 38.24 | 1/17/01 | 263.5 | n/a | n/a |
| 1/25/01 | 9.2 | 565.5 | 739.29 | 67.5 | 38.75 | 1/24/01 | 259 | n/a | n/a |
| 2/1/01 | 9.65 | 582.5 | 757.08 | 68.5 | 39.49 | 1/31/01 | 240 | n/a | n/a |
| 2/8/01 | 9.23 | 601 | 751.61 | 72.5 | 39.74 | 2/7/01 | 254 | n/a | n/a |
| 2/15/01 | 9.25 | 637 | 747.94 | 72 | 39.76 | 2/14/01 | 252 | n/a | n/a |
| 2/22/01 | 9.25 | 647 | 743.36 | 72.25 | 40.5 | 2/21/01 | 249.5 | n/a | n/a |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 3/1/01 | 9.27 | 655 | 751.06 | 81.5 | 40.25 | 2/28/01 | 253 | n/a | n/a |
| 3/8/01 | 9.31 | 670.5 | 775.96 | 82 | 39.31 | 3/7/01 | 253 | n/a | n/a |
| 3/15/01 | 9.31 | 652 | 749.28 | 78.75 | 38.33 | 3/14/01 | 244 | n/a | n/a |
| 3/22/01 | 9.31 | 618.5 | 717.74 | 74.25 | 37.77 | 3/21/01 | 245 | n/a | n/a |
| 3/29/01 | 9.14 | 621 | 708.04 | 77.5 | 37.81 | 3/28/01 | 243 | n/a | n/a |
| 4/5/01 | n/a | 628 | 750.73 | 79 | 37.99 | 4/4/01 | 230 | n/a | n/a |
| 4/12/01 | n/a | 624 | 769.48 | 81.25 | 37.85 | 4/11/01 | 225.5 | n/a | n/a |
| 4/19/01 | n/a | 608 | 771.87 | 83.5 | 38.05 | 4/18/01 | 230 | n/a | n/a |
| 4/26/01 | n/a | 625 | 767.34 | 83.5 | 38.9 | 4/25/01 | 215 | n/a | n/a |
| 5/3/01 | n/a | 599.5 | 721.51 | 80.5 | 38.5 | 5/2/01 | 205 | n/a | n/a |
| 5/10/01 | n/a | 610 | 714.76 | 79.75 | 39.1 | 5/9/01 | 204 | n/a | n/a |
| 5/17/01 | n/a | 608 | 715.36 | 81 | 37.58 | 5/16/01 | 204 | n/a | n/a |
| 5/24/01 | n/a | 581.5 | 705.49 | 82.75 | 37.94 | 5/23/01 | 204.75 | n/a | n/a |
| 5/31/01 | n/a | 607 | 716.67 | 83.25 | 38 | 5/30/01 | 200 | n/a | n/a |
| 6/7/01 | n/a | 623 | 724.36 | 83.75 | 38.85 | 6/6/01 | 221.75 | 6/8/01 | 35 |
| 6/14/01 | n/a | 625 | 706.61 | 88 | 38.75 | 6/13/01 | 206 | 6/15/01 | 34 |
| 6/21/01 | n/a | 640 | 704.89 | 87.75 | 38.35 | 6/20/01 | 209 | 6/22/01 | 34.1 |
| 6/28/01 | n/a | 662 | 650.86 | 82.75 | 38.5 | 6/27/01 | 201 | 6/29/01 | 32.7 |
| 7/5/01 | n/a | 645.5 | 677.91 | 80.75 | 38.25 | 7/4/01 | 210 | 7/6/01 | 32.5 |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 7/12/01 | n/a | 665 | 636.61 | 81 | 38.85 | 7/11/01 | 201 | 7/13/01 | 31.5 |
| 7/19/01 | n/a | 665 | 647.49 | 82 | 38.51 | 7/18/01 | 201 | 7/20/01 | 30.55 |
| 7/26/01 | n/a | 660 | 646.29 | 84 | 38 | 7/25/01 | 190 | 7/27/01 | 29 |
| 8/2/01 | n/a | 668 | 649.74 | 77.25 | 37.8 | 8/1/01 | 201 | 8/3/01 | 31.7 |
| 8/9/01 | n/a | 651 | 621.94 | 59.75 | 37.61 | 8/8/01 | 195 | 8/10/01 | 33.2 |
| 8/16/01 | n/a | 654 | 598.93 | 98 | 37.38 | 8/15/01 | 192 | 8/17/01 | 33 |
| 8/23/01 | n/a | 650 | 570.39 | 98.5 | 37.59 | 8/22/01 | 195 | 8/24/01 | 32.5 |
| 8/30/01 | n/a | 645.5 | 602.41 | 97 | 36.84 | 8/29/01 | 190 | 8/31/01 | 33.6 |
| 9/6/01 | n/a | 637 | 574.19 | 95.75 | 36.85 | 9/5/01 | 174 | 9/7/01 | 30.5 |
| 9/13/01 | n/a | 534 | 500.09 | 87.75 | 33.2 | 9/12/01 | 168 | 9/14/01 | 23 |
| 9/20/01 | n/a | 507.5 | 434.18 | 79.25 | 29.7 | 9/19/01 | 138 | 9/21/01 | 19.2 |
| 9/27/01 | n/a | 513 | 397.79 | 40.5 | 29.48 | 9/26/01 | 127 | 9/28/01 | 22.8 |
| 10/04/01 | n/a | 510 | 408.82 | 43 | 29.48 | 10/3/01 | 90 | 10/5/01 | 23 |
| 10/11/01 | n/a | 544 | 464.9 | 49.25 | 27.4 | 10/10/01 | 94.5 | 10/12/01 | 23.6 |
| 10/18/01 | n/a | 562 | 472.58 | 51 | 29.3 | 10/17/01 | 95 | 10/19/01 | 22.5 |
| 10/25/01 | n/a | 575 | 463.93 | 51.5 | 27.19 | 10/24/01 | 130 | 10/26/01 | 22.5 |
| 11/1/01 | n/a | 565 | 476.6 | 53 | 26.2 | 10/31/01 | 120 | 11/2/01 | 21 |
| 11/8/01 | n/a | 581 | 474.25 | 54 | 27.29 | 11/7/01 | 110 | 11/9/01 | 23.3 |
| 11/15/01 | n/a | 572 | 472.55 | 56 | 29.6 | 11/14/01 | 99.5 | 11/16/01 | 25.5 |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 11/22/01 | n/a | 586 | 480.54 | 57.25 | 29.7 | 11/21/01 | 111 | 11/23/01 | 27 |
| 11/29/01 | n/a | 590 | 477.58 | 56.75 | 29.37 | 11/28/01 | 101 | 11/30/01 | 27 |
| 12/6/01 | n/a | 583 | 488.84 | 55.75 | 30.25 | 12/5/01 | 91.1 | 12/7/01 | 26.1 |
| 12/13/01 | n/a | 555.5 | 499.96 | 56.75 | 30.38 | 12/12/01 | 95 | 12/14/01 | 25.4 |
| 12/20/01 | n/a | 545 | 541.6 | 57 | 29.6 | 12/19/01 | 88.05 | 12/21/01 | 26.05 |
| 12/27/01 | n/a | 564.5 | 540.05 | 58 | 29.88 | 12/26/01 | 93 | 12/28/01 | 26.55 |
| 1/3/02 | n/a | 580 | 522.62 | 57.25 | 30.14 | 1/2/02 | 90 | 1/4/02 | 28.1 |
| 1/10/02 | n/a | 588 | 556.08 | 63.75 | 30.36 | 1/9/02 | 99.95 | 1/11/02 | 26.7 |
| 1/17/02 | n/a | 607 | 562.76 | 61.5 | 32 | 1/16/02 | 99 | 1/18/02 | 26.6 |
| 1/24/02 | n/a | 617 | 560.11 | 61.75 | 32.4 | 1/23/02 | 94 | 1/25/02 | 28.1 |
| 1/31/02 | n/a | 631.5 | 559.59 | 60.5 | 32.76 | 1/30/02 | 91.5 | 2/1/02 | 28 |
| 2/7/02 | n/a | 649 | 558.98 | 60 | 34 | 2/6/02 | 89.25 | 2/8/02 | 28 |
| 2/14/02 | n/a | 648 | 569.78 | 55.5 | 34.26 | 2/13/02 | 89.5 | 2/15/02 | 29.85 |
| 2/21/02 | n/a | 632.5 | 573.7 | 56.5 | 34.25 | 2/20/02 | 88 | 2/22/02 | 29.2 |
| 2/28/02 | n/a | 638.5 | 589.64 | 57.25 | 32.45 | 2/27/02 | 85 | 3/1/02 | 29.7 |
| 3/7/02 | n/a | 669 | 613.35 | 58 | 33.5 | 3/6/02 | 85 | 3/8/02 | 30.9 |
| 3/14/02 | n/a | 665 | 610.41 | 62 | 34.46 | 3/13/02 | 92 | 3/15/02 | 30 |
| 3/21/02 | n/a | 632 | 602 | 61 | 34.7 | 3/20/02 | 98.5 | 3/22/02 | 27.7 |
| 3/28/02 | n/a | 637 | 611.66 | 61.25 | 35.75 | 3/27/02 | 110 | 3/29/02 | 26.2 |

Appendix B.6: Historical Share Prices (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 4/4/02 | n/a | 631.5 | 598.72 | 61.5 | 35.3 | 4/3/02 | 117 | 4/5/02 | 27.5 |
| 4/11/02 | n/a | 642.5 | 594.52 | 60.75 | 35.27 | 4/10/02 | 115.5 | 4/12/02 | 26.95 |
| 4/18/02 | n/a | 640.5 | 585.89 | 60.5 | 37.9 | 4/17/02 | 112.25 | 4/19/02 | 28 |
| 4/25/02 | n/a | 651 | 598.93 | 60 | 37.45 | 4/24/02 | 110.25 | 4/26/02 | 25.3 |
| 5/2/02 | n/a | 646.5 | 605.63 | 63.25 | 35.99 | 5/1/02 | 119 | 5/3/02 | 25.1 |
| 5/9/02 | n/a | 638 | 657 | 62 | 36 | 5/8/02 | 110.5 | 5/10/02 | 24 |
| 5/16/02 | n/a | 623 | 645.9 | 60.5 | 36.01 | 5/15/02 | 110.5 | 5/17/02 | 25.1 |
| 5/23/02 | n/a | 621 | 642.98 | 62.75 | 35.7 | 5/22/02 | 116 | 5/24/02 | 25.9 |
| 5/30/02 | n/a | 619 | 636.91 | 61.75 | 35.9 | 5/29/02 | 116 | 5/31/02 | 25.9 |
| 6/6/02 | n/a | 616 | 648.02 | 63.5 | 35.7 | 6/5/02 | 126 | 6/7/02 | 26 |
| 6/13/02 | n/a | 618.5 | 596.84 | 63 | 35.25 | 6/12/02 | 124 | 6/14/02 | 25.1 |
| 6/20/02 | n/a | 595 | 568.89 | 59.75 | 34.82 | 6/19/02 | 123.25 | 6/21/02 | 24 |
| 6/27/02 | n/a | 593 | 573.61 | 65 | 35 | 6/26/02 | 113 | 6/28/02 | 23.85 |
| 7/4/02 | n/a | 586.5 | 583.21 | 69 | 34.25 | 7/3/02 | 112.25 | 7/5/02 | 23.9 |
| 7/11/02 | n/a | 545 | 584.57 | 71 | 33.65 | 7/10/02 | 111.25 | 7/12/02 | 23.75 |
| 7/18/02 | n/a | 520 | 583.84 | 67.25 | 33.88 | 7/17/02 | 105 | 7/19/02 | 23.2 |
| 7/25/02 | n/a | 470.5 | 546.28 | 61.5 | 32.08 | 7/24/02 | 93.95 | 7/26/02 | 20 |
| 8/1/02 | n/a | 482.5 | 545.15 | 66.75 | 30.85 | 7/31/02 | 99 | 8/2/02 | 20.3 |
| 8/8/02 | n/a | 520.5 | 543.9 | 68.25 | 30.97 | 8/7/02 | 98 | 8/9/02 | 21.5 |

Appendix B.6: Historical Sahre Price (cont'd)

| Date / Currency | ADR Dead – Delist. 29 Mar 01 | BAA | Kobenhavns Lufthavn | TBI | Flughafen Wien | Date / Currency | Flughafen Zurich | Date / Currency | FRAPORT |
|---|---|---|---|---|---|---|---|---|---|
| | EUR | GBP (p) | DKK | GBP (p) | EUR | | CHF | | EUR |
| 8/15/02 | n/a | 568.5 | 544.98 | 73 | 32 | 8/14/02 | 101 | 8/16/02 | 21.8 |
| 8/22/02 | n/a | 575 | 549.2 | 70.5 | 32.2 | 8/21/02 | 97.25 | 8/23/02 | 23.9 |
| 8/29/02 | n/a | 549 | 543.8 | 64 | 31.13 | 8/28/02 | 102 | 8/30/02 | 24.9 |
| 9/5/02 | n/a | 513 | 530.67 | 62.25 | 30.32 | 9/4/02 | 93 | 9/6/02 | 25.5 |
| 9/12/02 | n/a | 530 | 500.9 | 65 | 30.6 | 9/11/02 | 81.75 | 9/13/02 | 22.85 |
| 9/19/02 | n/a | 521 | 476.43 | 56 | 31 | 9/18/02 | 75.1 | 9/20/02 | 21.2 |
| 9/26/02 | n/a | 525 | 447.71 | 50 | 31 | 9/25/02 | 67.25 | 9/27/02 | 20.8 |
| 10/03/02 | n/a | 530.5 | 446.74 | 56.5 | 30.98 | 10/2/02 | 67.9 | 10/4/02 | 19.3 |
| 10/10/02 | n/a | 532 | 409.98 | 53 | 30.99 | 10/9/02 | 50 | 10/11/02 | 19.8 |
| 10/17/02 | n/a | 572.5 | 459.82 | 50.25 | 32.2 | 10/16/02 | 52.25 | 10/18/02 | 21.75 |
| 10/24/02 | n/a | 574 | 489.97 | 54 | 32.85 | 10/23/02 | 52 | 10/25/02 | 21.75 |
| 10/31/02 | n/a | 570.5 | 500.52 | 56.5 | 33.89 | 10/30/02 | 52 | 11/1/02 | 20 |
| 11/7/02 | n/a | 563 | 533.86 | 58.75 | 35.15 | 11/6/02 | 49.5 | 11/8/02 | 21 |
| 11/14/02 | n/a | 550 | 539.97 | 54.25 | 34.85 | 11/13/02 | 49.25 | 11/15/02 | 21.2 |
| 11/21/02 | n/a | 540.5 | 524.66 | 56.5 | 34.45 | 11/20/02 | 50 | 11/22/02 | 21.2 |
| 11/28/02 | n/a | 546 | 519.49 | 57 | 34.05 | 11/27/02 | 45.8 | 11/29/02 | 20.7 |
| 12/5/02 | n/a | 507 | 529.99 | 57.5 | 33.35 | 12/4/02 | 47.8 | 12/6/02 | 19.65 |
| 12/12/02 | n/a | 518 | 538.45 | 56.25 | 33.5 | 12/11/02 | 48.9 | 12/13/02 | 17.9 |
| 12/19/02 | n/a | 493 | 539.28 | 47 | 31.97 | 12/18/02 | 45 | 12/20/02 | 17.25 |
| 12/26/02 | n/a | 496.5 | 534.28 | 45 | 32.2 | 12/25/02 | 43.5 | 12/27/02 | 17 |

Source: Datastream®

## Appendix C.1: Descriptive Statistics: Unweighted Arithmetic Group Means for the Period 1990 – 1999

| Airport Grouping | Total Cost per WLU (indexed to 1995) | Operating Cost per WLU (indexed to 1995) | Depreciation Cost per WLU (indexed to 1995) | Asset Utilization (WLU / Total Assets in '000) | Total Asset Turnover | Fixed Asset Turnover | Total Revenue per WLU (indexed to 1995) |
|---|---|---|---|---|---|---|---|
| Total Sample of Airports | 14.62 € | 13.37 € | 2.23 € | 32.077 | .468 | .937 | 16.10 € |
| Publicly Owned Airports | 16.07 € | 14.70 € | 2.56 € | 35.888 | .550 | 1.269 | 17.24 € |
| Privatised Airports | 12.41 € | 11.36 € | 1.72 € | 26.361 | .344 | .440 | 14.36 € |
| Partially Priv. Airports | 15.97 € | 14.78 € | 2.45 € | 29.998 | .494 | .759 | 18.67 € |
| Fully Privatised Airports | 11.15 € | 10.15 € | 1.46 € | 25.073 | .291 | .327 | 12.84 € |
| Airports in the British Isles | 13.85 € | 12.82 € | 1.73 € | 23.688 | .373 | .448 | 15.87 € |
| BAA Owned Airports | 12.26 € | 10.91 € | 1.68 € | 21.723 | .295 | .312 | 13.92 € |
| UK/Irish Airports | 14.74 € | 13.88 € | 1.76 € | 24.779 | .417 | .523 | 16.96 € |
| Airports Main-land Europe | 15.42 € | 13.96 € | 2.75 € | 41.054 | .569 | 1.461 | 16.33 € |
| German Airports | 19.98 € | 17.78 € | 3.65 € | 28.130 | .549 | .641 | 20.41 € |
| Other European Airports | 13.23 € | 12.12 € | 2.32 € | 47.454 | .578 | 1.867 | 14.37 € |
| Airport Systems | 16.03 € | 14.95 € | 1.75 € | 25.443 | .476 | .585 | 18.26 € |

Appendix C.1: Descriptive Statistics: Unweighted Arithmetic Group Means for the Period 1990 – 1999 (cont'd)

| Airport Grouping | Total Revenue per Currency Unit of Share-holders' Funds | Aeronautical Revenue per WLU (indexed to 1995) | Non-Aeronautical Share of Total Revenue | Commercial Revenue per Terminal PAX (indexed to 1995) | Revenue / Expenditure Ratio | Return on Total Assets (ROA) | Return on Capital Employed (ROCE) |
|---|---|---|---|---|---|---|---|
| Total Sample of Airports | 1.841 | 9.21 € | 43.21% | 7.30 € | 1.125 | 4.20% | 8.16% |
| Publicly Owned Airports | 2.672 | 9.83 € | 43.24% | 7.67 € | 1.073 | 3.33% | 7.94% |
| Privatised Airports | .664 | 8.26 € | 43.15% | 6.74 € | 1.204 | 5.50% | 8.49% |
| Partially Priv. Airports | 1.229 | 11.83 € | 37.45% | 7.07 € | 1.195 | 7.12% | 10.51% |
| Fully Privatised Airports | .464 | 6.99 € | 45.17% | 6.63 € | 1.207 | 4.93% | 7.78% |
| Airports in the British Isles | .627 | 8.92 € | 42.56% | 7.38 € | 1.187 | 5.44% | 8.05% |
| BAA Owned Airports | .522 | 6.84 € | 50.80% | 7.78 € | 1.208 | 5.68% | 9.28% |
| UK/Irish Airports | .686 | 10.08 € | 37.99% | 7.16 € | 1.176 | 5.31% | 7.36% |
| Airports Main-land Europe | 3.238 | 9.50 € | 43.88% | 7.22 € | 1.060 | 2.87% | 8.28% |
| German Airports | 2.436 | 13.43 € | 34.28% | 7.50 € | 1.022 | 1.75% | 7.70% |
| Other European Airports | 3.681 | 7.61 € | 48.50% | 7.08 € | 1.078 | 3.43% | 8.57% |
| Airport Systems | 1.406 | 5.71 € | 67.10% | 12.06 € | 1.119 | 5.14% | 8.39% |

Appendix C.1: Descriptive Statistics: Unweighted Arithmetic Group Means for the Period 1990 – 1999 (cont'd)

| Airport Grouping | Operating Margin | EBITDA Margin | Return on Net Assets (RONA b.I.a.T.) | Return on Total Revenue (ROS) | Return on Shareholders' Funds (ROE) | Debt Ratio | Gearing (Debt / Equity Ratio) |
|---|---|---|---|---|---|---|---|
| Total Sample of Airports | 16.83% | 31.22% | 25.21% | 8.47% | 8.67% | 53.83% | 214.27% |
| Publicly Owned Airports | 14.78% | 30.51% | 31.84% | 5.96% | 8.00% | 62.52% | 304.56% |
| Privatised Airports | 19.96% | 32.31% | 15.83% | 12.29% | 9.63% | 40.80% | 86.47% |
| Partially Priv. Airports | 22.24% | 35.36% | 24.99% | 15.05% | 15.44% | 48.97% | 127.55% |
| Fully Privatised Airports | 19.16% | 31.23% | 12.59% | 11.32% | 7.57% | 37.91% | 71.91% |
| Airports in the British Isles | 18.64% | 29.81% | 13.12% | 11.93% | 8.86% | 37.74% | 66.03% |
| BAA Owned Airports | 21.26% | 33.47% | 15.99% | 11.33% | 9.22% | 37.52% | 84.47% |
| UK/Irish Airports | 17.18% | 27.78% | 11.52% | 12.26% | 8.66% | 37.86% | 55.78% |
| Airports Main-land Europe | 14.94% | 32.71% | 39.13% | 4.84% | 8.47% | 71.05% | 384.85% |
| German Airports | 12.20% | 30.02% | 27.61% | 1.41% | 1.35% | 74.86% | 393.25% |
| Other European Airports | 16.26% | 34.00% | 45.50% | 6.49% | 12.40% | 69.16% | 380.20% |
| Airport Systems | 17.93% | 28.52% | 15.57% | 8.95% | 3.86% | 56.85% | 255.54% |

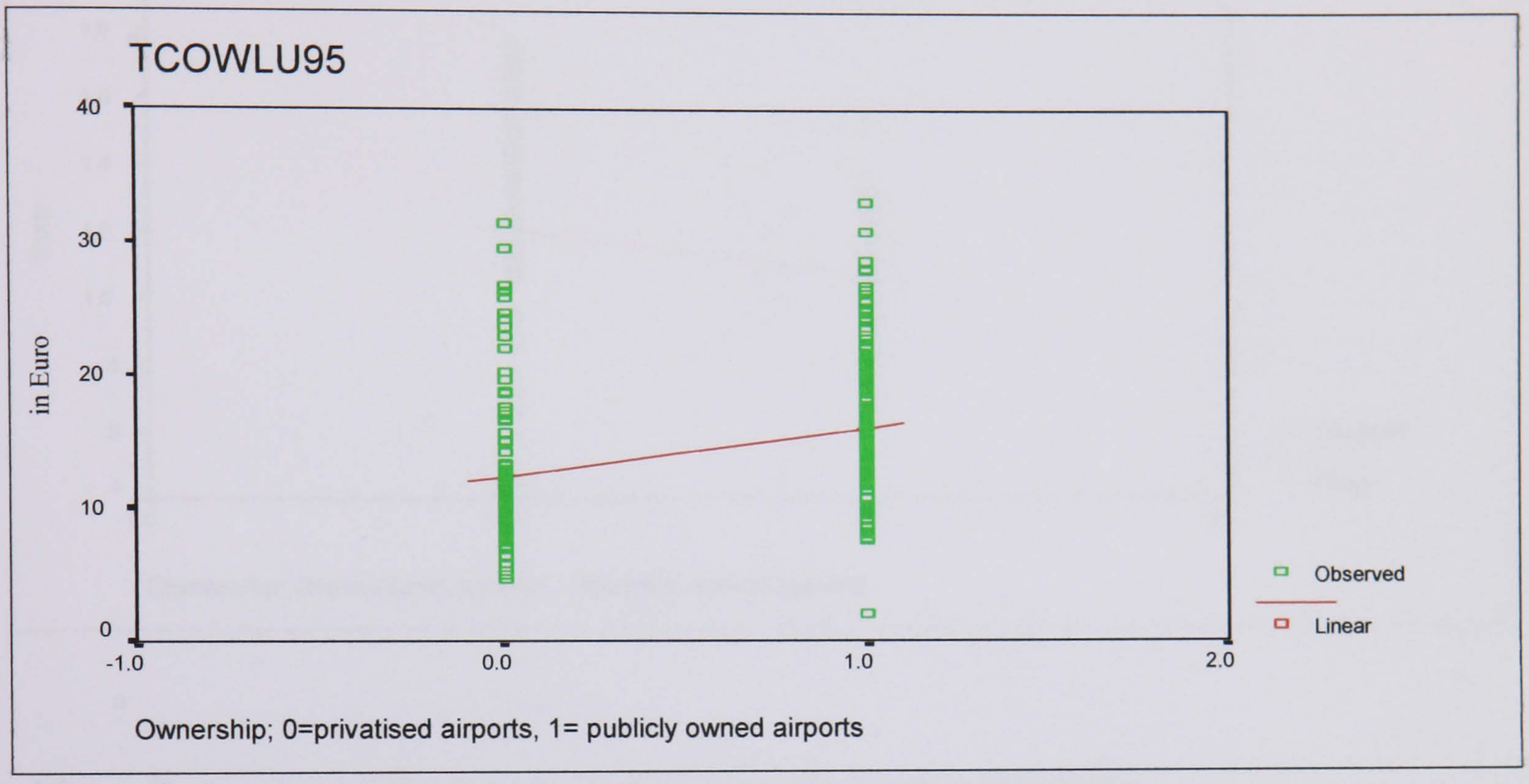
Appendix C.1: Descriptive Statistics: Unweighted Arithmetic Group Means for the Period 1990 – 1999 (cont'd)

| Airport Grouping | Net Assets in Percent of Total Assets | Financial Leverage | Cash Flow in Percent of Total Revenue | Investment Coverage Ratio (Cash Flow / Capex) | Capital Expenditure per Terminal PAX (indexed to 1995) | Capital Expenditure in Percent of Total Revenue | Capital Expenditure to Depreciation Ratio |
|---|---|---|---|---|---|---|---|
| Total Sample of Airports | 47.79% | 314.27% | 22.86% | 1.178 | 6.25 € | 33.88% | 2.656 |
| Publicly Owned Airports | 39.73% | 404.56% | 21.69% | 1.080 | 5.63 € | 28.12% | 2.003 |
| Privatised Airports | 59.20% | 186.47% | 24.64% | 1.327 | 7.20 € | 42.70% | 3.658 |
| Partially Priv. Airports | 51.03% | 227.55% | 28.17% | 1.392 | 6.65 € | 33.25% | 2.848 |
| Fully Privatised Airports | 62.09% | 171.91% | 23.39% | 1.302 | 7.40 € | 46.19% | 3.957 |
| Airports in the British Isles | 62.26% | 166.03% | 23.10% | 1.345 | 6.16 € | 35.19% | 3.303 |
| BAA Owned Airports | 62.48% | 184.47% | 23.54% | 1.188 | 8.74 € | 52.07% | 4.218 |
| UK/Irish Airports | 62.14% | 155.78% | 22.86% | 1.433 | 4.73 € | 25.81% | 2.794 |
| Airports Main- and Europe | 31.13% | 484.85% | 22.61% | .991 | 6.34 € | 32.42% | 1.937 |
| German Airports | 25.14% | 493.25% | 19.23% | .802 | 8.32 € | 32.27% | 1.923 |
| Other European Airports | 34.44% | 480.20% | 24.24% | 1.090 | 5.30 € | 32.50% | 1.944 |
| Airport Systems | 43.15% | 355.54% | 19.54% | .865 | 5.18 € | 25.86% | 3.142 |

## Appendix C.2: Regression Analysis

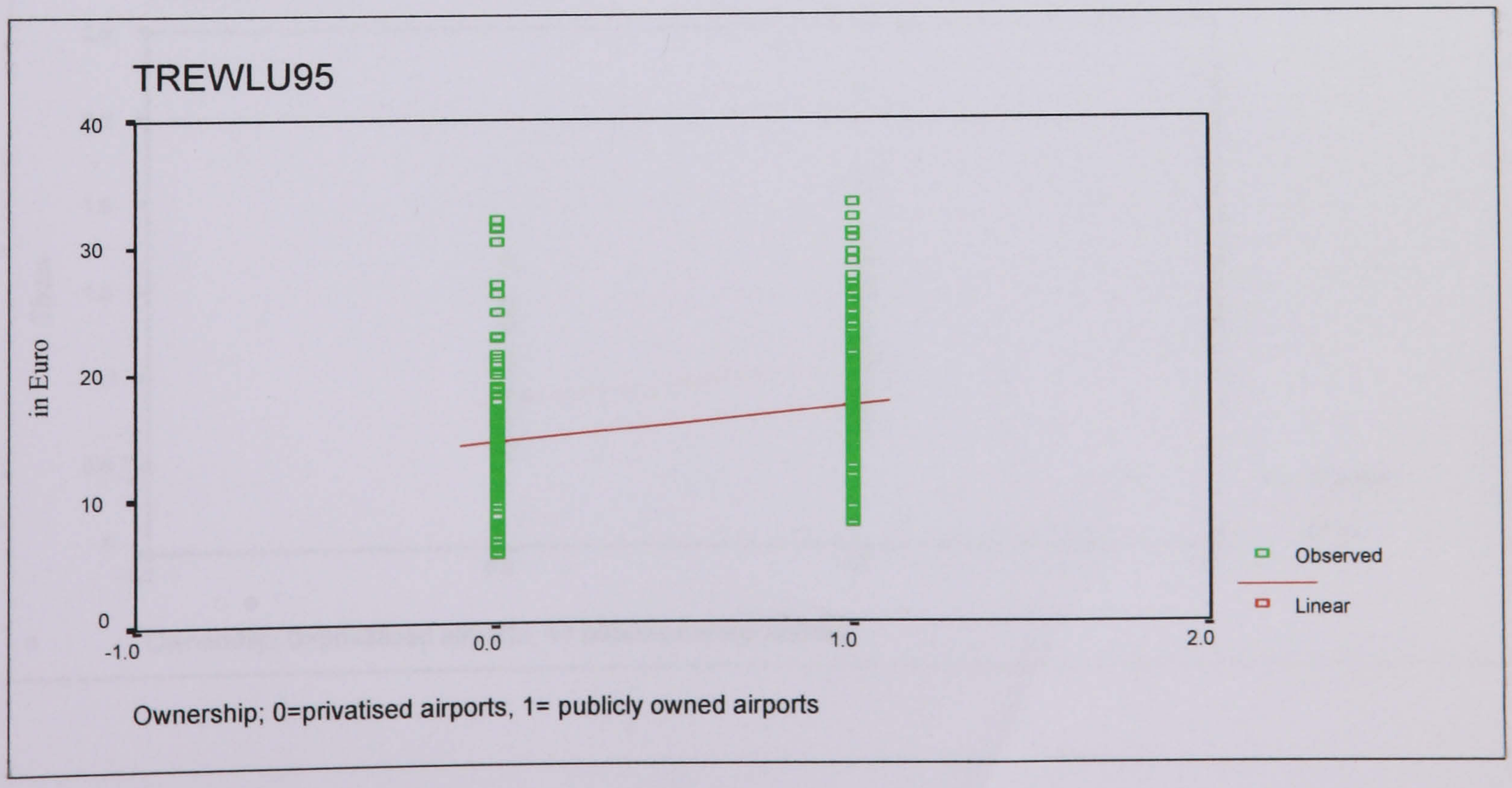
Linear Regression of Inflation-Adjusted Total Cost per WLU vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | TCOWLU95 | .107 | 326 | 38.97 | 6.243 | .000 | 12.4102 | 3.6593 |



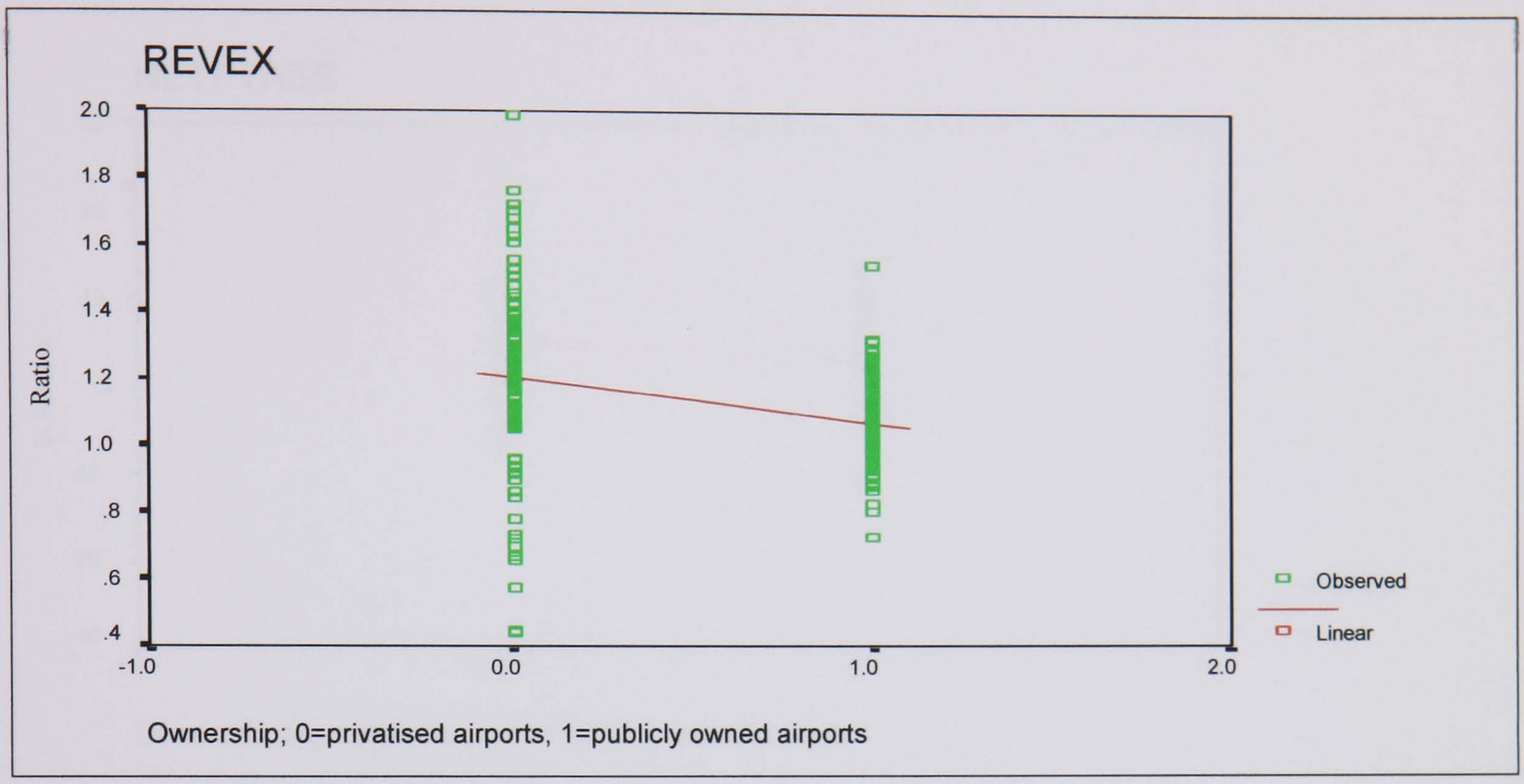

Linear Regression of Inflation-Adjusted Total Revenue per WLU vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | TREWLU95 | .067 | 326 | 23.53 | 4.851 | .000 | 14.3614 | 2.8762 |



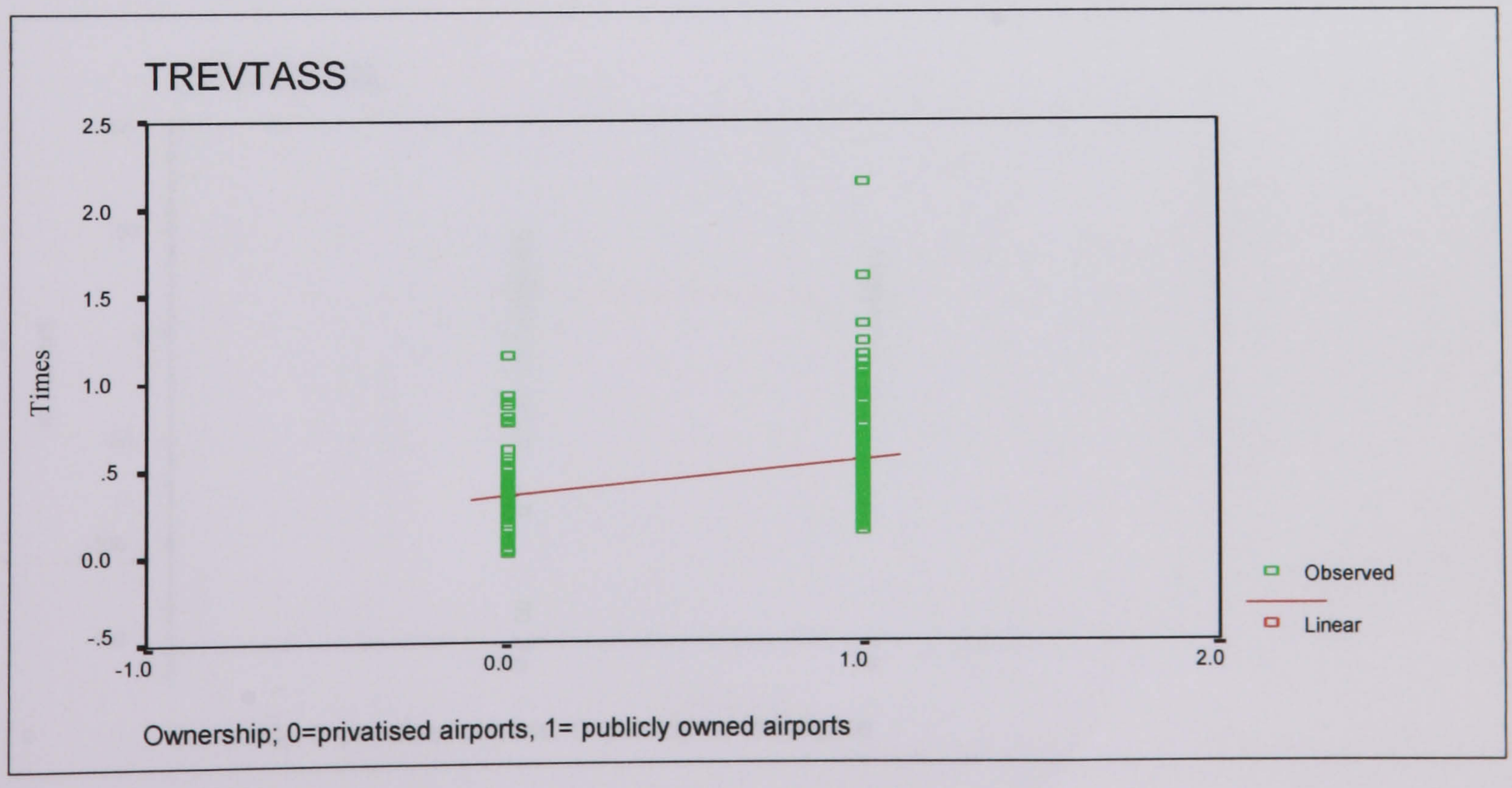
Linear Regression of the Revenue / Expenditure Ratio vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | REVEX | .121 | 326 | 44.87 | -6.698 | .000 | 1.2038 | -.1305 |



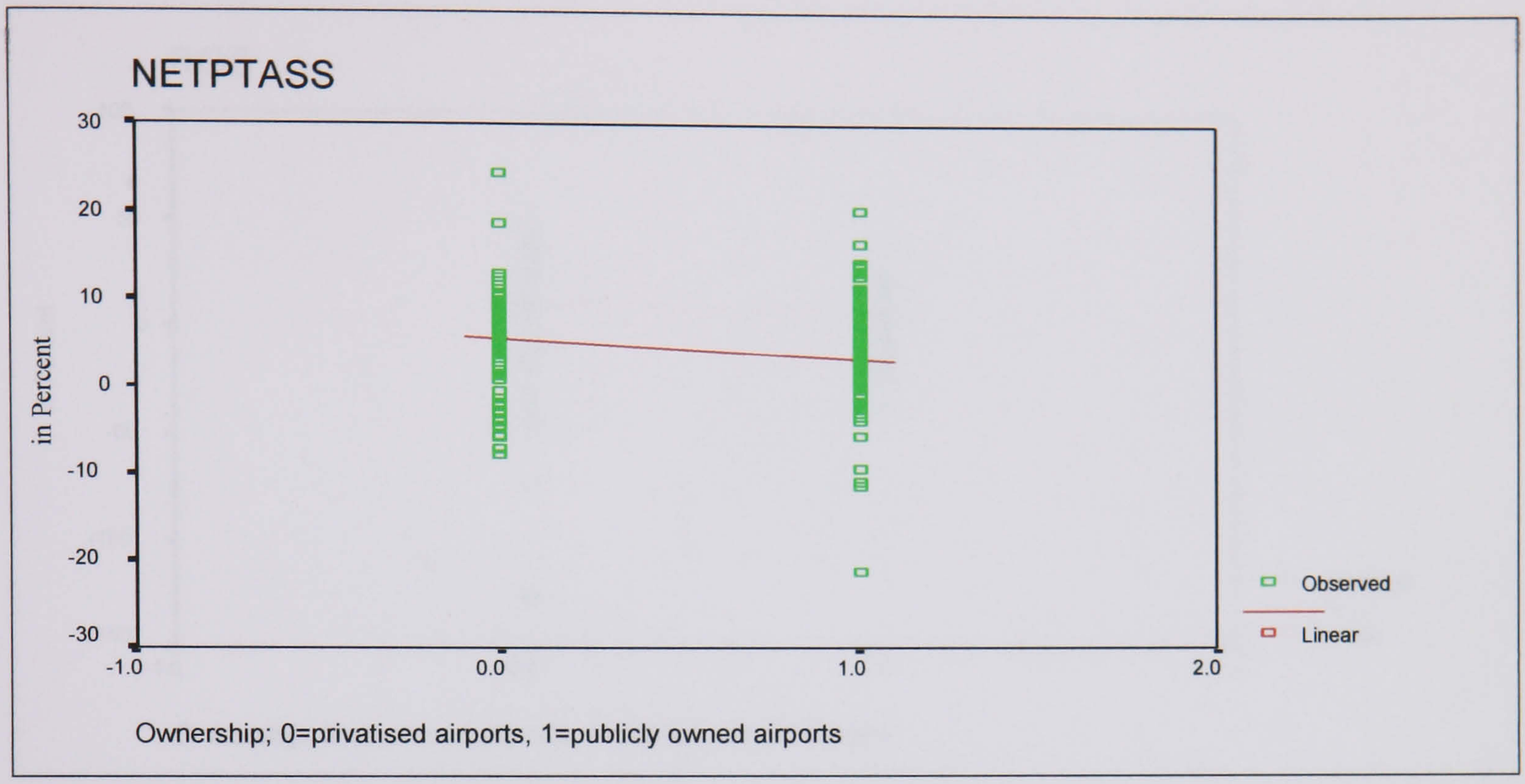

Linear Regression of Total Asset Turnover vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | TREVTASS | .138 | 323 | 51.77 | 7.195 | .000 | .3440 | .2064 |



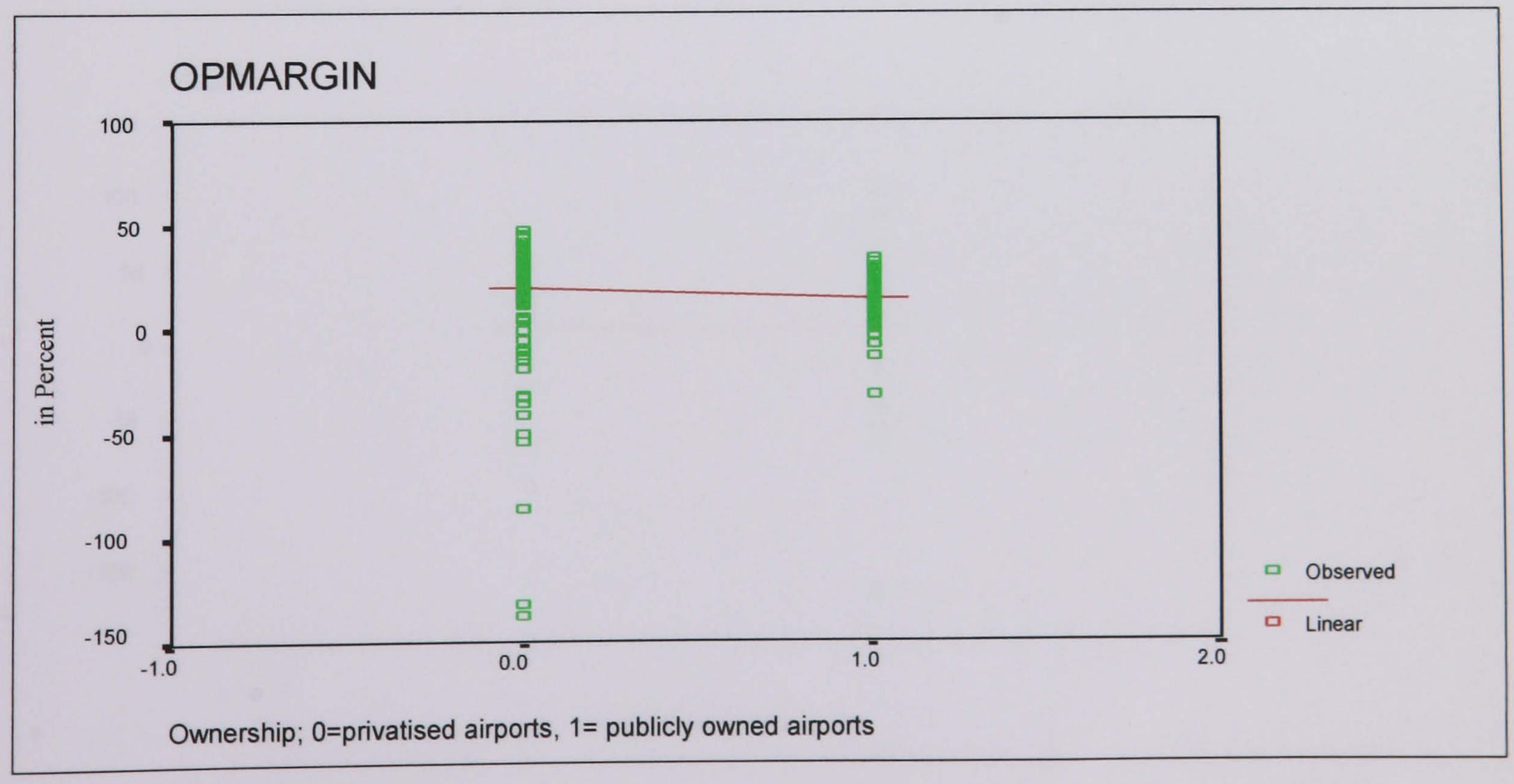
Linear Regression of Return on Total Assets (ROA) vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | NETPTASS | .044 | 323 | 15.00 | -3.874 | .000 | 5.5005 | -2.1672 |



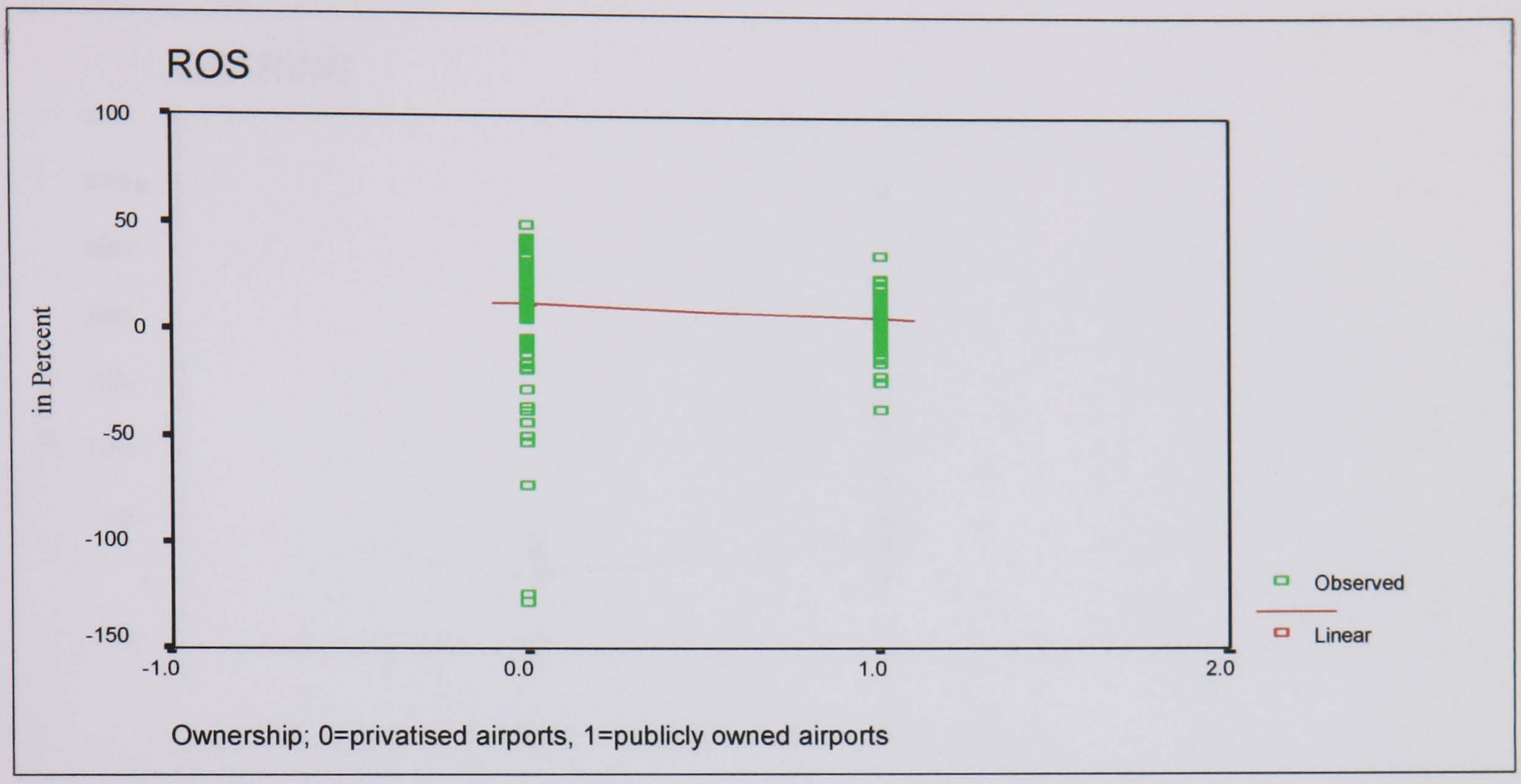

Linear Regression of Operating Margin vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | OPMARGIN | .016 | 326 | 5.35 | -2.313 | .021 | 19.9629 | -5.1867 |



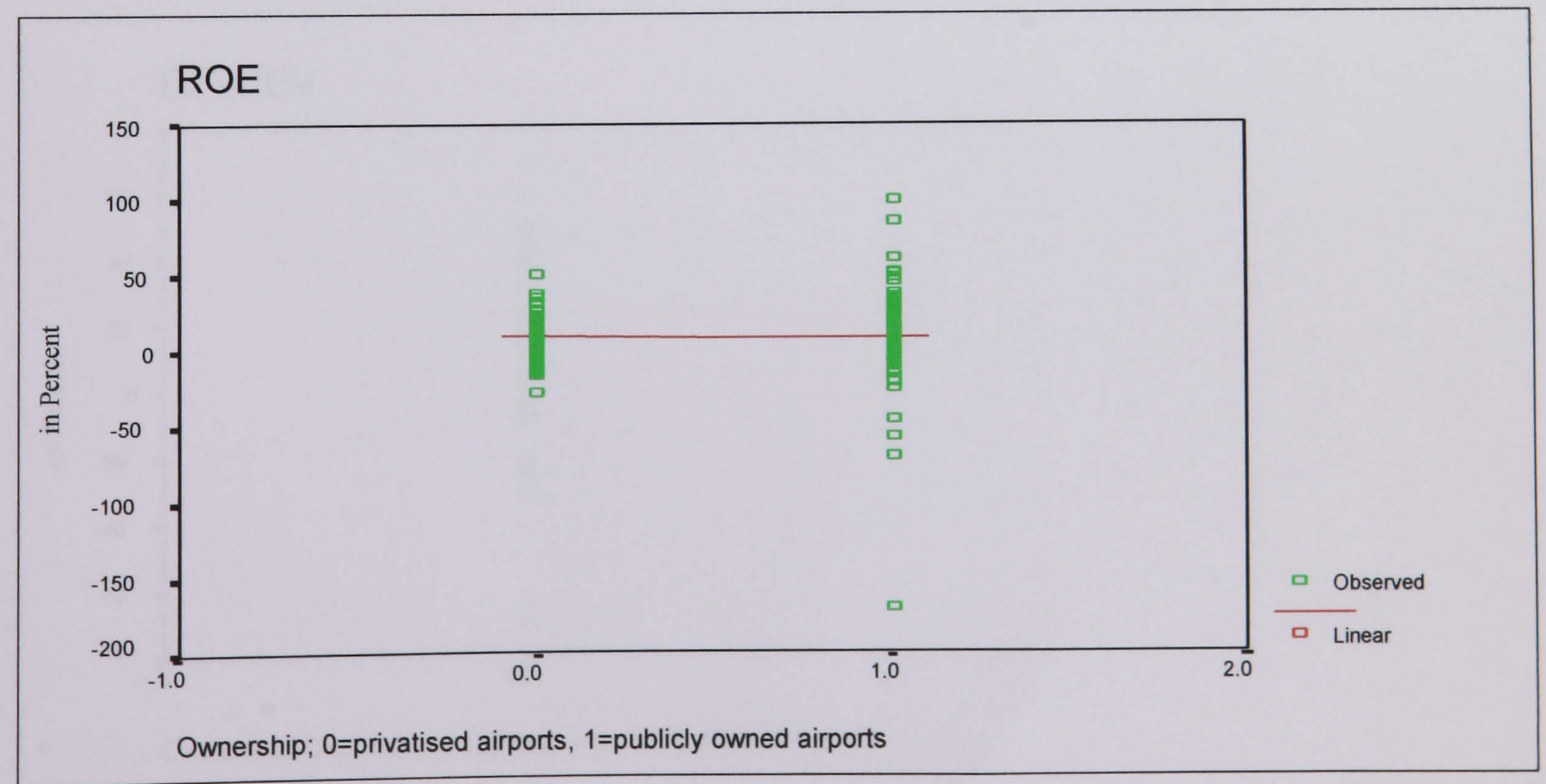
Linear Regression of Return on Total Revenue (ROS) vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | ROS | .030 | 326 | 10.06 | -3.172 | .002 | 12.2934 | -6.3302 |



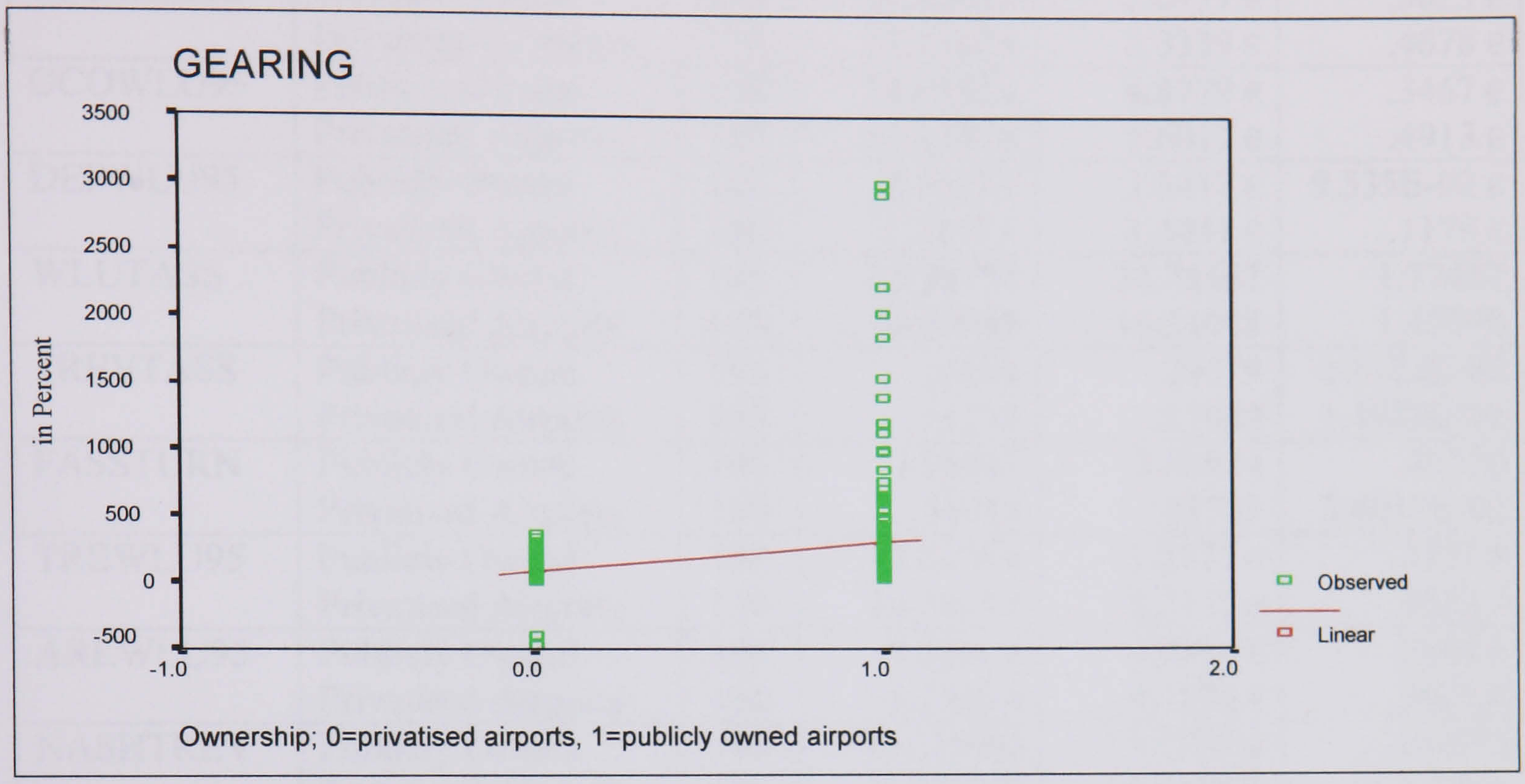

Linear Regression of Return on Shareholders' Funds (ROE) vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | ROE | .002 | 312 | .54 | -.732 | .465 | 9.6283 | -1.6279 |



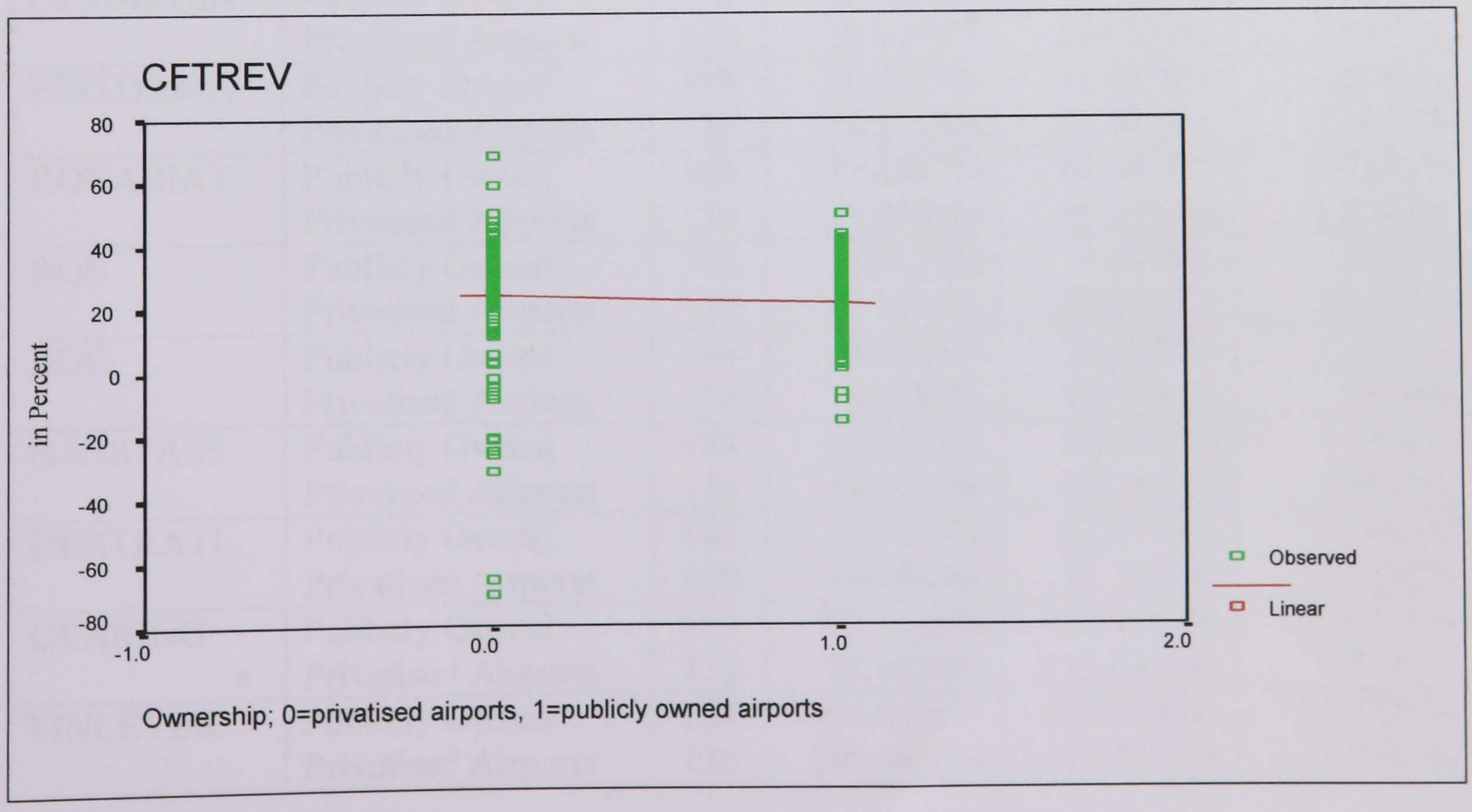
Linear Regression of Gearing (Debt / Equity Ratio) vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | GEARING | .089 | 312 | 30.47 | 5.520 | .000 | 86.4650 | 218.098 |




Linear Regression of Cash Flow in Percent of Total Revenue vs. Ownership Structure

| Independent | Dependent | Rsq | d.f. | F | t | Sig. | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| OWNER1 | CFTREV | .009 | 326 | 3.10 | -1.762 | .079 | 24.6423 | -2.9498 |



## Appendix C.3: Independent Samples t-Test

Table C.3.1: Independent Samples t-Test Group Statistics

| Ratio | Ownership Structure | N | Mean | Standard Deviation | Standard Error Mean |
|---|---|---|---|---|---|
| TCOWLU95 | Publicly Owned | 198 | 16.0695 € | 5.0977 € | .3623 € |
| | Privatised Airports | 130 | 12.4102 € | 5.3339 € | .4678 € |
| OCOWLU95 | Publicly Owned | 198 | 14.6952 € | 4.8779 € | .3467 € |
| | Privatised Airports | 130 | 11.3640 € | 5.6017 € | .4913 € |
| DEPWLU95 | Publicly Owned | 198 | 2.5627 € | 1.3417 € | 9.535E-02 € |
| | Privatised Airports | 130 | 1.7168 € | 1.3441 € | .1179 € |
| WLUTASS | Publicly Owned | 195 | 35.88754 | 24.78467 | 1.77487 |
| | Privatised Airports | 130 | 26.36095 | 16.54048 | 1.45070 |
| TREVTASS | Publicly Owned | 195 | .55041 | .29579 | 2.1182E-02 |
| | Privatised Airports | 130 | .34397 | .17089 | 1.4988E-02 |
| FASSTURN | Publicly Owned | 195 | 1.26897 | 3.66924 | .26276 |
| | Privatised Airports | 130 | .44014 | .38783 | 3.4015E-02 |
| TREWLU95 | Publicly Owned | 198 | 17.2376 € | 5.2777 € | .3751 € |
| | Privatised Airports | 130 | 14.3614 € | 5.2135 € | .4572 € |
| AREWLU95 | Publicly Owned | 198 | 9.8281 € | 4.0860 € | .2904 € |
| | Privatised Airports | 130 | 8.2560 € | 4.1283 € | .3621 € |
| NASHTREV | Publicly Owned | 198 | 43.2399% | 15.5195% | 1.1029% |
| | Privatised Airports | 130 | 43.1522% | 15.0390% | 1.3190% |
| CREPAX95 | Publicly Owned | 198 | 7.6673 € | 3.3612 € | .2389 € |
| | Privatised Airports | 130 | 6.7435 € | 2.9550 € | .2592 € |
| REVEX | Publicly Owned | 198 | 1.07333 | .10358 | 7.3611E-03 |
| | Privatised Airports | 130 | 1.20382 | .24264 | 2.1281E-02 |
| NETPTASS | Publicly Owned | 195 | 3.3333% | 4.9593% | .3551% |
| | Privatised Airports | 130 | 5.5005% | 4.9143% | .4310% |
| ROCE | Publicly Owned | 195 | 7.9397% | 6.6167% | .4738% |
| | Privatised Airports | 130 | 8.4910% | 6.1451% | .5390% |
| OPMARGIN | Publicly Owned | 198 | 14.7762% | 8.9527% | .6362% |
| | Privatised Airports | 130 | 19.9629% | 29.5781% | 2.5942% |
| EBITDAMA | Publicly Owned | 198 | 30.5055% | 11.4559% | .8141% |
| | Privatised Airports | 130 | 32.3118% | 24.6304% | 2.1602% |
| RONABIAT | Publicly Owned | 184 | 31.8387% | 67.5852% | 4.9825% |
| | Privatised Airports | 130 | 15.8345% | 17.3343% | 1.5203% |
| ROS | Publicly Owned | 198 | 5.9632% | 9.2078% | .6544% |
| | Privatised Airports | 130 | 12.2934% | 25.6980% | 2.2539% |
| ROE | Publicly Owned | 184 | 8.0005% | 23.6057% | 1.7402% |
| | Privatised Airports | 130 | 9.6283% | 10.9790% | .9629% |
| NASSTASS | Publicly Owned | 184 | 39.7253% | 20.4389% | 1.5068% |
| | Privatised Airports | 130 | 59.2016% | 23.7410% | 2.0822% |
| DEBTRATI | Publicly Owned | 195 | 62.5156% | 21.8745% | 1.5665% |
| | Privatised Airports | 130 | 40.7984% | 23.7410% | 2.0822% |
| GEARING | Publicly Owned | 184 | 304.5626% | 440.4789% | 32.4725% |
| | Privatised Airports | 130 | 86.4650% | 111.4425% | 9.7742% |
| FINLEVER | Publicly Owned | 184 | 404.5626% | 440.4790% | 32.4725% |
| | Privatised Airports | 130 | 186.4650% | 111.4425% | 9.7742% |

Table C.3.1: Independent Samples t-Test Group Statistics (cont'd)

| Ratio | Ownership Structure | N | Mean | Standard Deviation | Standard Error Mean |
|---|---|---|---|---|---|
| CFTREV | Publicly Owned | 198 | 21.6926% | 9.9874% | .7098% |
| | Privatised Airports | 130 | 24.6423% | 20.0897% | 1.7620% |
| CFCAPEX | Publicly Owned | 193 | 1.0804 | .8766 | 6.310E-02 |
| | Privatised Airports | 126 | 1.3266 | 2.0521 | .1828 |
| TREVSHF | Publicly Owned | 184 | 2.67249 | 4.63862 | .34196 |
| | Privatised Airports | 130 | .66427 | .74776 | 6.5583E-02 |
| CAPPAX95 | Publicly Owned | 193 | 5.6274 € | 4.0519 € | .2917 € |
| | Privatised Airports | 126 | 7.1998 € | 19.8686 € | 1.7700 € |
| CAPTREV | Publicly Owned | 193 | 28.1233% | 17.7904% | 1.2806% |
| | Privatised Airports | 126 | 42.6958% | 108.7415% | 9.6875% |
| CAPEXDEP | Publicly Owned | 193 | 2.0025 | 1.2929 | 9.307E-02 |
| | Privatised Airports | 126 | 3.6575 | 4.7304 | .4214 |

Table C.3.2: Independent Samples Test

| Ratio | Equal Variances • assumed • not assumed | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Signif. | t | d.f. | Signif. (2-tailed) | Mean Difference | Standard Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| TCOWLU95 | assumed | .556 | .456 | 6.243 | 326 | .000 | 3.6593 € | .5861 € | 2.5062 € | 4.8124 € |
| | not assumed | | | 6.184 | 267.193 | .000 | 3.6593 € | .5917 € | 2.4943 € | 4.8243 € |
| OCOWLU95 | assumed | .043 | .835 | 5.701 | 326 | .000 | 3.3311 € | .5843 € | 2.1816 € | 4.4807 € |
| | not assumed | | | 5.540 | 249.007 | .000 | 3.3311 € | .6013 € | 2.1469 € | 4.5154 € |
| DEPWLU95 | assumed | .204 | .651 | 5.581 | 326 | .000 | .8458 € | .1516 € | .5477 € | 1.1440 € |
| | not assumed | | | 5.579 | 275.725 | .000 | .8458 € | .1516 € | .5474 € | 1.1443 € |
| WLUTASS | assumed | 9.821 | .002 | 3.847 | 323 | .000 | 9.52659 | 2.47608 | 4.65532 | 14.39786 |
| | not assumed | | | 4.156 | 322.998 | .000 | 9.52659 | 2.29231 | 5.01685 | 14.03632 |
| TREVTASS | assumed | 37.787 | .000 | 7.195 | 323 | .000 | .20645 | 2.8692E-02 | .15000 | .26289 |
| | not assumed | | | 7.956 | 317.284 | .000 | .20645 | 2.5948E-02 | .15539 | .25750 |
| FASSTURN | assumed | 10.480 | .001 | 2.565 | 323 | .011 | .82883 | .32317 | .19304 | 1.46462 |
| | not assumed | | | 3.128 | 200.472 | .002 | .82883 | .26495 | .30638 | 1.35128 |
| TREWLU95 | assumed | 3.085 | .080 | 4.851 | 326 | .000 | 2.8762 € | .5929 € | 1.7098 € | 4.0426 € |
| | not assumed | | | 4.863 | 278.450 | .000 | 2.8762 € | .5914 € | 1.7120 € | 4.0404 € |
| AREWLU95 | assumed | 4.846 | .028 | 3.394 | 326 | .001 | 1.5721 € | .4631 € | .6610 € | 2.4832 € |
| | not assumed | | | 3.387 | 274.062 | .001 | 1.5721 € | .4641 € | .6584 € | 2.4858 € |
| NASHTREV | assumed | .122 | .727 | .051 | 326 | .960 | .0877% | 1.7306% | -3.3169% | 3.4923% |
| | not assumed | | | .051 | 282.137 | .959 | .0877% | 1.7194% | -3.2967% | 3.4721% |
| CREPAX95 | assumed | .032 | .858 | 2.552 | 326 | .011 | .9239 € | .3620 € | .2118 € | 1.6360 € |
| | not assumed | | | 2.621 | 299.658 | .009 | .9239 € | .3525 € | .2303 € | 1.6175 € |

Table C.3.2: Independent Samples Test (cont'd)

| Ratio | Equal Variances • assumed • not assumed | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Signif. | t | d.f. | Signif. (2-tailed) | Mean Difference | Standard Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| REVEX | assumed | 41.816 | .000 | -6.698 | 326 | .000 | -.13049 | 1.9481E-02 | -.16881 | -9.21640E-02 |
| | not assumed | | | -5.795 | 160.213 | .000 | -.13049 | 2.2518E-02 | -.17496 | -8.60163E-02 |
| NETPTASS | assumed | .012 | .911 | -3.874 | 323 | .000 | -2.1672% | .5595% | -3.2680% | -1.0665% |
| | not assumed | | | -3.881 | 278.320 | .000 | -2.1672% | .5585% | -3.2666% | -1.0679% |
| ROCE | assumed | .196 | .658 | -.757 | 323 | .450 | -.5513% | .7283% | -1.9842% | .8815% |
| | not assumed | | | -.768 | 290.198 | .443 | -.5513% | .7176% | -1.9638% | .8611% |
| OPMARGIN | assumed | 44.683 | .000 | -2.313 | 326 | .021 | -5.1867% | 2.2425% | -9.5982% | -.7752% |
| | not assumed | | | -1.942 | 144.643 | .054 | -5.1867% | 2.6710% | -10.4660% | .0926% |
| EBITDAMA | assumed | 17.849 | .000 | -.895 | 326 | .371 | -1.8063% | 2.0173% | -5.7749% | 2.1623% |
| | not assumed | | | -.782 | 166.054 | .435 | -1.8063% | 2.3085% | -6.3641% | 2.7516% |
| RONABIAT | assumed | 7.408 | .007 | 2.638 | 312 | .009 | 16.0042% | 6.0663% | 4.0681% | 27.9404% |
| | not assumed | | | 3.072 | 216.007 | .002 | 16.0042% | 5.2092% | 5.7368% | 26.2717% |
| ROS | assumed | 28.743 | .000 | -3.172 | 326 | .002 | -6.3302% | 1.9957% | -10.2563% | -2.4042% |
| | not assumed | | | -2.697 | 150.962 | .008 | -6.3302% | 2.3469% | -10.9673% | -1.6932% |
| ROE | assumed | 7.384 | .007 | -.732 | 312 | .465 | -1.6279% | 2.2237% | -6.0031% | 2.7474% |
| | not assumed | | | -.818 | 275.568 | .414 | -1.6279% | 1.9889% | -5.5432% | 2.2875% |
| NASSTASS | assumed | 3.512 | .062 | -7.775 | 312 | .000 | -19.4764% | 2.5051% | -24.4054% | -14.5473% |
| | not assumed | | | -7.578 | 250.965 | .000 | -19.4764% | 2.5702% | -24.5383% | -14.4144% |
| DEBTRATI | assumed | .909 | .341 | 8.472 | 323 | .000 | 21.7173% | 2.5633% | 16.6744% | 26.7601% |
| | not assumed | | | 8.335 | 260.792 | .000 | 21.7173% | 2.6057% | 16.5864% | 26.8481% |

Table C.3.2: Independent Samples Test (cont'd)

| Ratio | Equal Variances • assumed • not assumed | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Signif. | t | d.f. | Signif. (2-tailed) | Mean Difference | Standard Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| GEARING | assumed | 31.158 | .000 | 5.520 | 312 | .000 | 218.0976% | 39.5131% | 140.3518% | 295.8435% |
| | not assumed | | | 6.431 | 215.156 | .000 | 218.0976% | 33.9116% | 151.2561% | 284.9392% |
| FINLEVER | assumed | 31.158 | .000 | 5.520 | 312 | .000 | 218.0977% | 39.5131% | 140.3518% | 295.8435% |
| | not assumed | | | 6.431 | 215.156 | .000 | 218.0977% | 33.9116% | 151.2561% | 284.9392% |
| CFTREV | assumed | 18.106 | .000 | -1.762 | 326 | .079 | -2.9498% | 1.6743% | -6.2435% | .3440% |
| | not assumed | | | -1.553 | 171.309 | .122 | -2.9498% | 1.8996% | -6.6993% | .7998% |
| CFCAPEX | assumed | 27.076 | .000 | -1.474 | 317 | .141 | -.2461 | .1670 | -.5747 | 8.242E-02 |
| | not assumed | | | -1.273 | 155.126 | .205 | -.2461 | .1934 | -.6282 | .1359 |
| TREVSHF | assumed | 25.587 | .000 | 4.889 | 312 | .000 | 2.00822 | .41074 | 1.20006 | 2.81638 |
| | not assumed | | | 5.768 | 196.332 | .000 | 2.00822 | .34820 | 1.32154 | 2.69490 |
| CAPPAX95 | assumed | 3.739 | .054 | -1.067 | 317 | .287 | -1.5724 € | 1.4739 € | -4.4723 € | 1.3275 € |
| | not assumed | | | -.877 | 131.817 | .382 | -1.5724 € | 1.7939 € | -5.1210 € | 1.9761 € |
| CAPTREV | assumed | 6.864 | .009 | -1.826 | 317 | .069 | -14.5725% | 7.9800% | -30.2729% | 1.1279% |
| | not assumed | | | -1.491 | 129.381 | .138 | -14.5725% | 9.7717% | -33.9056% | 4.7606% |
| CAPEXDEP | assumed | 28.599 | .000 | -4.607 | 317 | .000 | -1.6550 | .3592 | -2.3618 | -.9483 |
| | not assumed | | | -3.835 | 137.278 | .000 | -1.6550 | .4316 | -2.5084 | -.8016 |

## Appendix C.4: Paired-Samples t-Test

Table C.4.1: Paired-Samples Statistics

| | Ratio | Mean | N | Standard Deviation | Standard Error Mean |
|---|---|---|---|---|---|
| Pair 1 | TCOWL95B | 17.8618 € | 9 | 6.7605 € | 2.2535 € |
| | TCOWL95A | 14.3491 € | 9 | 6.6220 € | 2.2073 € |
| Pair 2 | OCOWL95B | 16.8946 € | 9 | 6.5361 € | 2.1787 € |
| | OCOWL95A | 13.1184 € | 9 | 6.3236 € | 2.1079 € |
| Pair 3 | DEPWL95B | 2.0814 € | 9 | 1.2561 € | .4187 € |
| | DEPWL95A | 1.7535 € | 9 | 1.4298 € | .4766 € |
| Pair 4 | WLUTASSB | 35.25084 | 9 | 22.46680 | 7.48893 |
| | WLUTASSA | 30.61887 | 9 | 19.89493 | 6.63164 |
| Pair 5 | TREVTASB | .56158 | 9 | .27426 | 9.1418E-02 |
| | TREVTASA | .49158 | 9 | .26557 | 8.8522E-02 |
| Pair 6 | FASTURNB | 1.38128 | 9 | 1.83930 | .61310 |
| | FASTURNA | .77991 | 9 | .69969 | .23323 |
| Pair 7 | TREWL95B | 19.5343 € | 9 | 7.0444 € | 2.3481 € |
| | TREWL95A | 17.2548 € | 9 | 6.5904 € | 2.1968 € |
| Pair 8 | ARWLU95B | 12.3219 € | 9 | 4.2559 € | 1.4186 € |
| | ARWLU95A | 10.7872 € | 9 | 4.3009 € | 1.4336 € |
| Pair 9 | NASHTREB | 35.6277% | 9 | 8.4402% | 2.8134% |
| | NASHTREA | 36.7970% | 9 | 9.8906% | 3.2969% |
| Pair 10 | CRPAX95B | 7.3584 € | 9 | 3.5148 € | 1.1716 € |
| | CRPAX95A | 6.9092 € | 9 | 2.8678 € | .9559 € |
| Pair 11 | REVEXB | 1.10719 | 9 | 7.7556E-02 | 2.5852E-02 |
| | REVEXA | 1.25343 | 9 | .20423 | 6.8077E-02 |
| Pair 12 | NETPTASB | 3.8833% | 9 | 1.2677% | .4226% |
| | NETPTASA | 7.3703% | 9 | 4.4731% | 1.4910% |
| Pair 13 | ROCEB | 6.9954% | 9 | 2.1111% | .7037% |
| | ROCEA | 11.2021% | 9 | 5.6361% | 1.8787% |
| Pair 14 | RONAB | 24.8181% | 9 | 22.7422% | 7.5807% |
| | RONAA | 25.0768% | 9 | 24.0209% | 8.0070% |
| Pair 15 | OPMARB | 14.4192% | 9 | 6.1162% | 2.0387% |
| | OPMARA | 25.6833% | 9 | 12.5153% | 4.1718% |
| Pair 16 | EBITDAMB | 24.7936% | 9 | 10.1876% | 3.3959% |
| | EBITDAMA | 35.4142% | 9 | 11.6399% | 3.8800% |
| Pair 17 | ROSB | 8.9449% | 9 | 5.5666% | 1.8555% |
| | ROSA | 17.9723% | 9 | 12.9650% | 4.3217% |
| Pair 18 | ROEB | 10.5966% | 9 | 6.4799% | 2.1600% |
| | ROEA | 15.3185% | 9 | 15.0358% | 5.0119% |
| Pair 19 | NASSTASB | 43.4553% | 9 | 22.2515% | 7.4172% |
| | NASSTASA | 46.9312% | 9 | 22.1791% | 7.3930% |
| Pair 20 | DEBTRAB | 56.5447% | 9 | 22.2515% | 7.4172% |
| | DEBTRAA | 53.0688% | 9 | 22.1791% | 7.3930% |
| Pair 21 | GEARINGB | 309.2369% | 9 | 418.4898% | 139.4966% |
| | GEARINGA | 125.8817% | 9 | 137.7714% | 45.9238% |

Note: Suffix 'B' stands for 'before privatisation'; suffix 'A' stands for 'after privatisation'.

Table C.4.1: Paired-Samples Statistics (cont'd)

| | Ratio | Mean | N | Standard Deviation | Standard Error Mean |
|---|---|---|---|---|---|
| Pair 22 | FINLEVB | 409.2369% | 9 | 418.4898% | 139.4966% |
| | FINLEVA | 225.8817% | 9 | 137.7714% | 45.9238% |
| Pair 23 | CFTREVB | 19.3193% | 9 | 8.5164% | 2.8388% |
| | CFTREVA | 27.7033% | 9 | 11.2839% | 3.7613% |
| Pair 24 | TRESHFB | 2.92215 | 9 | 3.93477 | 1.31159 |
| | TRESHFA | 1.25264 | 9 | 1.28894 | .42965 |
| Pair 25 | CFCAPEB | 1.550872 | 9 | 1.187480 | .395827 |
| | CFCAPEA | 1.760929 | 9 | 1.486681 | .495560 |
| Pair 26 | CAPAX95B | 5.0162 € | 9 | 5.1373 € | 1.7124 € |
| | CAPAX95A | 6.3189 € | 9 | 4.1554 € | 1.3851 € |
| Pair 27 | CAPTREVB | 20.9452% | 9 | 14.6255% | 4.8752% |
| | CAPTREVA | 31.9633% | 9 | 19.5009% | 6.5003% |
| Pair 28 | CAPEXDEB | 2.10636 | 9 | 1.00923 | .33641 |
| | CAPEXDEA | 3.79636 | 9 | 3.01616 | 1.00539 |

Note: Suffix 'B' stands for 'before privatisation'; suffix 'A' stands for 'after privatisation'.

Table C.4.2: Paired-Samples Correlations

| | Ratio | N | Correlation | Significance |
|---|---|---|---|---|
| Pair 1 | TCOWL95B & TCOWL95A | 9 | .918 | .000 |
| Pair 2 | OCOWL95B & OCOWL95A | 9 | .881 | .002 |
| Pair 3 | DEPWL95B & DEPWL95A | 9 | .904 | .001 |
| Pair 4 | WLUTASSB & WLUTASSA | 9 | .967 | .000 |
| Pair 5 | TREVTASB & TREVTASA | 9 | .950 | .000 |
| Pair 6 | FASTURNB & FASTURNA | 9 | .923 | .000 |
| Pair 7 | TREWL95B & TREWL95A | 9 | .948 | .000 |
| Pair 8 | ARWLU95B & ARWLU95A | 9 | .949 | .000 |
| Pair 9 | NASHTREB & NASHTREA | 9 | .848 | .004 |
| Pair 10 | CRPAX95B & CRPAX95A | 9 | .884 | .002 |
| Pair 11 | REVEXB & REVEXA | 9 | .509 | .162 |
| Pair 12 | NETPTASB & NETPTASA | 9 | .126 | .747 |
| Pair 13 | ROCEB & ROCEA | 9 | .054 | .891 |
| Pair 14 | RONAB & RONAA | 9 | .518 | .153 |
| Pair 15 | OPMARB & OPMARA | 9 | .368 | .330 |
| Pair 16 | EBITDAMB & EBITDAMA | 9 | .570 | .109 |
| Pair 17 | ROSB & ROSA | 9 | .572 | .108 |
| Pair 18 | ROEB & ROEA | 9 | .189 | .627 |
| Pair 19 | NASSTASB & NASSTASA | 9 | .674 | .046 |
| Pair 20 | DEBTRAB & DEBTRAA | 9 | .674 | .046 |
| Pair 21 | GEARINGB & GEARINGA | 9 | .553 | .123 |
| Pair 22 | FINLEVB & FINLEVA | 9 | .553 | .123 |
| Pair 23 | CFTREVB & CFTREVA | 9 | .526 | .145 |
| Pair 24 | TRESHFB & TRESHFA | 9 | .851 | .004 |
| Pair 25 | CFCAPEB & CFCAPEA | 9 | .117 | .764 |
| Pair 26 | CAPAX95B & CAPAX95A | 9 | .445 | .230 |
| Pair 27 | CAPTREVB & CAPTREVA | 9 | .020 | .959 |
| Pair 28 | CAPEXDEB & CAPEXDEA | 9 | -.358 | .345 |

Note: Suffix 'B' stands for 'before privatisation'; suffix 'A' stands for 'after privatisation'.

Table C.4.3: Paired-Samples Test

| | Ratio | t | d.f. | Sig. (2-tailed) | Paired Differences | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Mean | Standard Deviation | Standard Error Mean | 95% Confidence Interval of the Difference | |
| | | | | | | | | Lower | Upper |
| Pair 1 | TCOWL95B – TCOWL95A | 3.881 | 8 | .005 | 3.5127 € | 2.7152 € | .9051 € | 1.4256 € | 5.5998 € |
| Pair 2 | OCOWL95B – OCOWL95A | 3.608 | 8 | .007 | 3.7762 € | 3.1396 € | 1.0465 € | 1.3629 € | 6.1895 € |
| Pair 3 | DEPWL95B – DEPWL95A | 1.605 | 8 | .147 | .3279 € | .6127 € | .2042 € | -.1431 € | .7988 € |
| Pair 4 | WLUTASSB – WLUTASSA | 2.327 | 8 | .048 | 4.63198 | 5.97246 | 1.99082 | 4.1134E-02 | 9.22282 |
| Pair 5 | TREVTASB – TREVTASA | 2.452 | 8 | .040 | 7.0003E-02 | 8.5636E-02 | 2.8545E-02 | 4.1769E-03 | .13583 |
| Pair 6 | FASTURNB – FASTURNA | 1.474 | 8 | .179 | .60137 | 1.22365 | .40788 | -.33921 | 1.54195 |
| Pair 7 | TREWL95B – TREWL95A | 3.044 | 8 | .016 | 2.2795 € | 2.2464 € | .7488 € | .5527 € | 4.0063 € |
| Pair 8 | ARWLU95B – ARWLU95A | 3.352 | 8 | .010 | 1.5348 € | 1.3734 € | .4578 € | .4790 € | 2.5905 € |
| Pair 9 | NASHTREB – NASHTREA | -.669 | 8 | .522 | -1.1693% | 5.2418% | 1.7473% | -5.1985% | 2.8600% |
| Pair 10 | CRPAX95B – CRPAX95A | .813 | 8 | .440 | .4492 € | 1.6583 € | .5528 € | -.8254 € | 1.7239 € |
| Pair 11 | REVEXB – REVEXA | -2.468 | 8 | .039 | -.14624 | .17777 | 5.9256E-02 | -.28289 | -9.59647E-03 |
| Pair 12 | NETPTASB – NETPTASA | -2.328 | 8 | .048 | -3.4870% | 4.4931% | 1.4977% | -6.9407% | -.0332% |
| Pair 13 | ROCEB – ROCEA | -2.135 | 8 | .065 | -4.2068% | 5.9113% | 1.9704% | -8.7506% | .3371% |
| Pair 14 | RONAB – RONAA | -.034 | 8 | .974 | -.2587% | 22.9854% | 7.6618% | -17.9269% | 17.4094% |
| Pair 15 | OPMARB – OPMARA | -2.879 | 8 | .021 | -11.2640% | 11.7358% | 3.9119% | -20.2850% | -2.2431% |
| Pair 16 | EBITDAMB – EBITDAMA | -3.122 | 8 | .014 | -10.6206% | 10.2043% | 3.4014% | -18.4643% | -2.7769% |

Note: Suffix 'B' stands for 'before privatisation'; suffix 'A' stands for 'after privatisation'.

Table C.4.3: Paired-Samples Test (cont'd)

| | Ratio | t | d.f. | Sig. (2-tailed) | Paired Differences | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Mean | Standard Deviation | Standard Error Mean | 95% Confidence Interval of the Difference | |
| | | | | | | | | Lower | Upper |
| Pair 17 | ROSB – ROSA | -2.509 | 8 | .036 | -9.0275% | 10.7959% | 3.5986% | -17.3259% | -.7290% |
| Pair 18 | ROEB – ROEA | -.931 | 8 | .379 | -4.7219% | 15.2093% | 5.0698% | -16.4128% | 6.9689% |
| Pair 19 | NASSTASB – NASSTASA | -.581 | 8 | .577 | -3.4759% | 17.9344% | 5.9781% | -17.2614% | 10.3097% |
| Pair 20 | DEBTRAB – DEBTRAA | .581 | 8 | .577 | 3.4759% | 17.9344% | 5.9781% | -10.3097% | 17.2614% |
| Pair 21 | GEARINGB – GEARINGA | 1.523 | 8 | .166 | 183.3552% | 361.1053% | 120.3684% | -94.2149% | 460.9252% |
| Pair 22 | FINLEVB – FINLEVA | 1.523 | 8 | .166 | 183.3552% | 361.1053% | 120.3684% | -94.2149% | 460.9252% |
| Pair 23 | CFTREVB – CFTREVA | -2.532 | 8 | .035 | -8.3840% | 9.9335% | 3.3112% | -16.0196% | -.7484% |
| Pair 24 | TRESHFB – TRESHFA | 1.716 | 8 | .124 | 1.66950 | 2.91791 | .97264 | -.57340 | 3.91241 |
| Pair 25 | CFCAPEB – CFCAPEA | -.352 | 8 | .734 | -.210057 | 1.790843 | .596948 | -1.586621 | 1.166507 |
| Pair 26 | CAPAX95B – CAPAX95A | -.787 | 8 | .454 | -1.3028 € | 4.9663 € | 1.6554 € | -5.1202 € | 2.5147 € |
| Pair 27 | CAPTREVB – CAPTREVA | -1.369 | 8 | .208 | -11.0181% | 24.1411% | 8.0470% | -29.5746% | 7.5384% |
| Pair 28 | CAPEXDEB – CAPEXDEA | -1.446 | 8 | .186 | -1.69000 | 3.50620 | 1.16873 | -4.38510 | 1.00510 |

Note: Suffix 'B' stands for 'before privatisation'; suffix 'A' stands for 'after privatisation'.